

# THE IRON AGE

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## New Orders Increasing

### Export Demand Still a Marked Feature—A Possible Tin Plate Advance

The improvement in steel trade conditions has been more marked in the past week. In some lines, as wire and tin plate, it is more pronounced than in the heavier products; but throughout the trade there is a definite impulse toward greater activity. One result has been the publication of extravagant statements, particularly grotesque being those referring to efforts to prevent price advances.

The Steel Corporation's statement gives a good gauge of what has taken place, in showing new orders averaging 30,000 tons a day in January up to the 27th, as against 22,000 tons a day in December and November, when it was plain that wear and tear were not being replaced by new buying. The New York Central and Pennsylvania tonnages, it is noted, are not included in the January figures.

Another index is the Steel Corporation's list of active blast furnaces, which in the first half of January showed about 47 per cent. of capacity in blast. To-day the percentage is 51, and will be advanced to 56, when five furnaces now being made ready are blown in.

The news of the double tracking programme of the Union Pacific, well timed with the Steel Corporation's report, has strongly reinforced the more cheerful sentiment of the week. Of the \$75,000,000 outlay the steel mills will get a substantial share. Probably 250,000 tons of rails, or 50,000 tons a year, will be needed, besides many thousands of tons of steel for bridges.

Exports have figured in a large way on the Steel Corporation's order books in the past fortnight. Canada's steel works have not been equal to the pressure on their finishing capacity, and 15,000 tons of billets will be shipped from Gary to a Canadian plant, which is in the market for a further round lot. The National Railways of Mexico have just placed in this country 20,000 tons of rails in addition to 5000 tons early in January.

At Ottawa, the commissioners of the Transcontinental Railway opened bids this week on 61,200 tons of 80-lb. rails. Canadian mills, it is likely, will be able to roll only a part of it. American mills may take some portion of the order for delivery at the Pacific end, but British mills have the benefit of the preferential tariff.

Considerable rail business is pending. The principal order of the week was given out by the Burlington. It was for 30,000 tons, equal lots going to the Illinois Steel, Colorado and Lackawanna companies. The Boston & Maine and New Haven orders, amounting together to 61,000 tons of open hearth rails, are about closed. The Rock Island has bought 10,000 tons and the Western Maryland has taken 12,000 tons, besides 9875 tons already reported.

Late structural contracts include 18,000 tons for the

Kenova, W. Va., bridge of the Norfolk & Western, taken by the American Bridge Company; 2500 tons for the New Haven catenary bridges, and 2200 tons for the Hayworth Building at Chicago. The Cruikshank Building, New York, will take 5000 tons. In the East reports persist of very low prices on fabricating contracts, which presumably are backed by concessions from some sellers of plain material. In the Chicago district, however, fabricating prices are stiffening and mill prices on shapes are reported firm.

While wire mills now have very satisfactory orders ahead for the spring trade, talk of a further advance in wire products is quite premature.

In the tin plate trade demand continues strong, in view of which and the added cost of 25 cents a box for tin in the past year, a 10 cent or 15 cent advance on tin plate would not be surprising.

In steel making pig iron there is a slightly better movement, but the foundry iron market both in price and in volume is quite out of step with finished lines. Western malleable foundries are in the market for iron for the second half, in view of contracts they are about making with railroads; but in general the foundry industry is in a discouraging state, which is closely reflected in foundry pig iron.

Sales of 100,000 tons of Newfoundland ore have been made at Philadelphia at 7 $\frac{3}{8}$ c. a unit, or  $\frac{3}{8}$ c. more than the last sale made for 1910 delivery. Foreign demand for these ores and the export duty of 7 $\frac{1}{2}$ c. a ton account for this advance, but the delivered price is still well below the Lake ore parity. Shipments of Newfoundland ores into Pennsylvania this year are expected to be about 285,000 tons.

### The Reciprocity Agreement with Canada

Negotiations for more favorable trade relations have been proceeding for some months between representatives of the United States and Canada. Announcements have been made from time to time that they were getting closer together in deciding upon the special articles on which duties could be mutually reduced. The task was a most difficult one, as the representatives of each country were necessarily anxious that the result of their labor would be such as would commend itself to the great mass of their people. It was desirable that they should avoid doing anything that would be seriously injurious to producers or manufacturers in their own countries, and yet it was essential that if trade relations were to be promoted, some concessions of a material character should be made. The agreement at which they have arrived is now before the people of the two countries, and undoubtedly much depends upon the expression of public sentiment thereon in securing ratification by the respective legislative bodies.

President Taft has transmitted a message to Congress in which he takes strong ground in favor of the adoption of the agreement precisely as it comes from the joint commissioners. In private and public utterances he has since emphasized the position thus taken, indicating that he thoroughly believes that the time is at hand for securing more liberal trade relations with our neighbors. Opposition of a strenuous character has developed in both the Senate and the House of Representatives, and the agreement is likely to have rather rough treatment in the discussions which will

take place on the floor of Congress. It may be that some of the provisions of the agreement may appear to those affected to bear heavily on certain of our producing and manufacturing interests. Nevertheless, if we are ever to improve our trade relations with Canada, this is the time to take favorable action. The representatives of the two countries have at last been able to agree upon schedules relating to quite a number of articles, and the agreement should be adopted unless the people of this country have made up their minds that they do not desire to establish better relations than those which have been latterly existing. The people of Canada have made great strides in the development of their country in recent years and take pardonable pride in that development. They feel that every year makes them more independent of other countries, and from time to time their duties have been advanced so as to make it more difficult for American products to reach Canadian markets. It may be assumed that this disposition will continue, and be even intensified if this agreement should be rejected by the United States.

### An Anti-Accident Inspection Service

Our correspondent "Manager," writing of workmen's compensation for accidents, makes a suggestion that should work out practically to the advantage both of the accident indemnity companies and of many manufacturers who contract for such insurance. It is that insurance against damage payments on account of industrial accidents should have connected with it a system of shop inspections comparable in safeguarding value with those of boiler and fire insurance companies. It is true that the industrial casualty insurance companies make preliminary inspections, with a view to deciding in which of their classes of hazards to place an industrial establishment for which they are writing a policy. The fact is, too, that as the result of such inspections it is sometimes pointed out that a certain expenditure of money by the manufacturing company will lessen the risk, and thus give it the benefit of a lower premium rate. But, as our correspondent points out, there is no such organization for the inspection of industrial plants as will give manufacturers the benefit of specialized and expert information in their respective lines of production and result in a definite reduction in the risk taken by the workman.

State factory inspection laws exist, as is well known; and it is equally well known that their execution is in too many instances so much a matter of politics and of graft as to make this branch of the public service a byword. Too often the evident purpose of State inspections is to harass and antagonize employers and appease a labor union demand for the punishment of noncompliant manufacturers. A service organized in the interest of safety—the conservation of human life and of the resources that are now wasted in preventable accidents—would eliminate these most objectionable features of State inspections, and its suggestions would be met with a respect and co-operation that could never be secured under political auspices.

What is of most importance, such an inspection would actually save human life and prevent an untold amount of suffering; and that, more than accident



compensation or legislation regulating payments for injury or death, is the great end of all the agitation that has been looming up as the most important industrial development of recent years.

### The Leaders in Pig Iron Production

In 1910 the United States, Germany and Great Britain for the first time brought their combined production of pig iron above 50,000,000 gross tons. This was due to the remarkable increases made by this country and Germany, the latter exceeding all performances of recent years by producing 1,876,000 tons more than in the previous year, while the United States added over 1,500,000 tons to its total for 1909. Great Britain, while official figures are lacking for the year, produced 4,993,000 tons in the first half, and probably fell somewhat below that in the second half. With the expansion in the world's trade in iron and steel last year indicated by the exports of the principal producing nations, it is fair to assume that France, Belgium, Austria, Russia, Canada, Italy, Spain and all the lesser iron making countries added to their outputs of 1909. The probabilities are, therefore, that the world's pig iron output in 1910 was not far short of 65,000,000 tons. The comparison of the three leading countries with the three years preceding 1910 is as follows in gross tons (figures for Germany in metric tons):

Pig Iron Production in United States, Germany and Great Britain, 1907-1910.—Tons.

	1910.	1909.	1908.	1907.
United States...	27,298,545	25,795,471	15,936,018	25,781,361
Germany.....	14,793,325	12,917,653	11,813,511	13,045,760
Great Britain...	9,800,000*	9,664,287	9,056,851	10,114,281
Totals.....	51,891,870	48,377,411	36,806,380	48,941,402

\* Estimated.

It is probable that stocks of pig iron in producers' hands in the three countries increased last year by more than the excess of production over 50,000,000 tons, or by more than 1,900,000 tons. In the United States the increase is estimated at fully 1,000,000 tons. For Germany the statement is made that with the increase of 1,876,000 tons in output over 1909, "heavy stocks accumulated," so many furnaces being kept going because their gases were needed for power. In Great Britain the Stocks in Connal's stores increased from 390,000 to 530,000 tons, or by 140,000 tons, against 253,000 tons increase in 1909, while stocks in producers' hands made a considerable gain. Both Germany and Great Britain, like the United States, are adding to their blast furnaces, so that it may fairly be said that the world is carrying a pig iron capacity representing a wide margin beyond any need that will be encountered in the immediate future.

### Limits of Large Marine Oil Engine Units

Illuminating deductions as to the future of the marine internal combustion engine are made by an editorial writer in *The Engineer*, London, based upon an analysis of the motive power of the new Dutch freighter *Vulcanus*, which is propelled by oil engines of the Diesel type. Making flat denial of the reports that the British Admiralty has adopted this class of motors for its ships, the article goes on to enumerate some of the difficulties which are yet to be overcome before the internal combustion engine can hope to replace steam, even in comparatively small ocean-going vessels. To quote a few paragraphs from the paper:

There are many boats propelled by internal combustion engines, but they are, with perhaps a couple of exceptions, either pleasure craft, purely experimental vessels, or small boats not venturing far from their base. The *Vulcanus* is a tramp steamer propelled by oil engines, and when she makes the first voyage from Holland to Borneo and back she will be the pioneer of a new navigation. Whichever the system leads we dare not venture an opinion. That the internal combustion engine will be used regularly for ocean voyages it is impossible to doubt, but whether the biggest ships will be propelled by it is as yet too soon to say. Between the 70,000 hp. of the *Mauretania* and the 500 hp. of the *Vulcanus* is more than arithmetical difference.

At the moment, the difficulties of building internal combustion engines of very high power have proved themselves insuperable, and we are forced to admit that we must not look for more than 1000 hp. per cylinder for some time to come. It is needless to add that no marine superintendent is likely to contemplate with favor the placing of 70 odd cylinders in a single vessel. Six large cylinders per shaft would, we imagine, be as great a number as could be looked upon as a practical proposition; with them we might expect a combined shaft power of, say, 20,000 to 24,000 on four shafts, and with that we could engine some such ship as the *Caronia* or *Carmania*, vessels about 650 ft. long, with a speed of 19 knots. Within the next 10 years we may see ships of that size plying across the Atlantic, but before then much water must flow under the bridges and much work be done on smaller powers. Messrs. Schneider are now building a marine oil engine of 1000 hp. per cylinder, but so far no power approaching that has been tried at sea; the *Vulcanus* develops only half that amount, in six cylinders.

A question that is likely to stand in the way of rapid development for some time to come is the much greater cost of fitting a ship with internal combustion than with steam engines. It is safe to say that for the same horse power the cost for the former will be 25 to 35 per cent. more than for the latter. The shipowner has to see many advantages before he will be prepared to pay the difference. That material advantages do exist—take alone a reduction of 50 per cent. or so in the cost of fuel—cannot be denied; but, nevertheless, where shipbuilders have offered, as in one or two cases they have already done, alternate designs and estimates for oil engines and steam turbines, the purchaser has thought only of the great cost of the former.

### A Government Hydraulic Testing Plant

A movement is in progress to interest the National Government in the establishment of a hydraulic testing plant. The purpose is to create a standard practice in water power development and permit of the testing of water wheels and other hydraulic apparatus under any and all conditions which might arise in connection with a power station. The theory is that the work of such an institution would constitute a very important step toward the conservation of one of the greatest of the country's resources. Experts assert that comparatively few, even of the most recent, installations in North America reach the standard of efficiency which might reasonably be expected, and many of them fall far behind this standard. Engineering tests are revealing such cases constantly.

Hydraulic engineering has developed greatly of late years, and practice is gradually improving, but standards of design have not been evolved, it is claimed, and the errors of engineers have proved costly in too many cases. Should the Government establish a plant on some important water power, such as Niagara Falls, with an ample supply of water at all seasons, exact data would become available, based upon long test and experiment, and the owner of a water power would have at his disposal information upon which his engineers would base the design of his installation. With the known conditions, such as head and volume of water, and the topography, the Governmental practice would furnish the remaining engineering data. To cite one of many problems, where a pair of wheels are employed, the distance between them in the pit would become an exact factor.

To-day the variation in this essential element is a wide one. Hydraulic units designed to develop 2500 hp. and upward have been found to yield little more than 2000 hp., because of faulty calculations and theory. The annual financial loss is easily realized. It is truthfully argued that every horsepower of water saved is an item of conservation of the fuel supply.

To the manufacturer who makes use of water power, the cost of his product depends upon the efficiency of his installation. If he invests a certain amount of money to secure a given power, and gets 10 or 15 or even 25 per cent. less than the estimates of his engineers called for, his investment charge is altogether too high. The waste is expensive. Apart from the matter of investment, these losses of power often result in a large increase in the cost of operating auxiliary steam plants. In drawing upon water storage during dry seasons, it makes a vast difference if an unnecessary quantity has to be used in creating a given horsepower. The supply does not last so long, of course, and dependence upon steam alone comes sooner. Time after time manufacturing plants have been obliged to start their engine to make up for a deficiency in power, less than would have been secured if the water power was producing to its designed capacity.

A conservative estimate puts it that at least 15 per cent., and probably more, of the water power now developed under modern conditions as to equipment is being thrown away. The hydraulic plant once created is there to stay. Great masses of masonry and concrete have been erected. Alterations mean large expenditures of money and long idleness. The time to discover faulty design is on the drafting table. Experimentation on a large scale seems necessary. A Government plant would not be a very costly institution. To an extent it would be self-supporting, through the fees of clients. The Government, it is pointed out, is spending large sums of money each year in experimental work on the various fuels, with the intention of conserving the supply to as great an extent as possible. Work on the hydraulic question would be along similar lines, for water power is the equivalent of fuel.

## Correspondence

### An Inspection System to Prevent Industrial Accidents

*To the Editor:* The present agitation on the subject of employers' liability has brought up certain considerations which I have not seen published and which seem to me to deserve careful thought. In the first place the expression "employers' liability" as a subject is an unfortunate one. What we should really turn our minds to is the subject of "accidents to workmen" during their regular employment.

Every one who has had experience as a manager knows that many accidents are caused by carelessness or very frequently willful disobedience on the part of employees, especially where the strength of the labor unions is such as to prevent the maintenance by the employer of strict discipline. But every one who has considered this subject knows also that the subject is not ended when this is stated. There are two other classes of accidents—casualties, pure and simple, and preventable accidents.

#### ACCIDENTS THAT CANNOT BE AVOIDED.

The former result from a fortuitous conjunction of circumstances which could by no possibility be foreseen or prevented. It seems likely that this class of accidents will always endure in those occupations in which man applies the great forces of nature to the accomplishment of his tasks on an industrial scale. The forces occasionally must escape from control and do harm to person and property. This is the law of probability and cannot be altered.

But as our knowledge increases the kinds of accidents which are classed in this group will occur less and less frequently, and the accidents themselves will also become less numerous because, as we find out more, we shall be enabled to see that some happenings now considered fortuitous would have been capable of prediction by a greater intelligence or a wider knowledge, and such accidents will be removed from this classification and put into the preventable class.

#### ACCIDENTS WHICH COULD HAVE BEEN PREVENTED.

Preventable accidents are those whose causes could be foreseen by a reasonable use of existing knowledge and so removed in time. Every man of wide industrial experience knows that plants under different management have very different personal equations in regard to the number of accidents which take place within their boundaries. At one plant, great care and forethought will be given to the prevention of accidents; the manager will be not only careful but conscientious, and will consider it a matter of personal responsibility and regret when an accident takes place. At a similar plant, only across the river, perhaps, a different class of management will care nothing for the number of men maimed or hurt, provided only that the ambulance-chasing lawyers can be silenced for a less sum per year than it would cost to operate on a more careful basis.

I personally know of a coal mine disaster whereby some 80 lives were lost, where the general manager (who was one of the principal owners) was described to have wept over the loss of the many friends whom he numbered among his employees, but who, it was proved by indisputable records, operated the mine in absolute disregard and neglect of every precaution urged upon him by the State mine inspector in his official report a week or two before the disaster. Everything he had been told to do had been left undone; everything he had been warned not to do had been done. One would think he would have felt personal responsibility, as if he had caused the death of the men who perished in the disaster, but there was no indication in his demeanor of anything of the sort. Such accidents as this are not casualties in any proper sense of that word, and the time will surely come when those responsible in such cases will be held for manslaughter on a gigantic scale.

#### INSPECTION OF INDUSTRIAL PLANTS.

The point sought to be emphasized is that of the accidents that now occur many are preventable by good management, and it is, therefore, our duty to discover a way in which the management may be assisted to prevent them. The large corporations now have their departments of safety with their inspectors, elaborately organized for this very purpose; but many of the smaller manufacturers, unable to afford this means of meeting the need, and not sufficiently organized to know how to apply it if they had the means, are contented to let the manager do the best he can and to cover up his shortcomings in this direction by employers' liability insurance. These insurance concerns divide all industries into broad classes, each one of which takes a certain rate, generally speaking, irrespective of local conditions, including management. Why should this be so?

Every intelligent manufacturer knows that boiler insurance is worth to him what it costs, for the independent inspection of his boilers, for the certainty that they are properly cared for and operated and that needed repairs are made in time to prevent disasters. In a general way, also, the operating practice is improved and money saved thereby. Why? Because the boiler insurance companies employ trained and competent men who are kept continually going from plant to plant, in-



specting boilers and all their appliances, operating conditions, safety devices, gauges, &c., thoroughly and effectually several times a year. They recommend what improvements shall be made, and if these are not made the insurance on that boiler is withdrawn.

With fire insurance the same plan is even more highly organized by the Board of Underwriters, with whose requirements the manufacturer must comply or his insurance is withdrawn with the stroke of a pen. No one acquainted with the facts can doubt that the insurance companies have benefited the community enormously by bettering the conditions for the prevention and extinguishment of fires. They also have different rates for different plants. If one man chooses to have a fire trap, where his neighbor across the street is carrying on the same business in a slow burning or a fireproof building, he must pay out 1 or 2 per cent. per year more on his investment than his neighbor to equalize the risk.

Why should we not have the same thing in regard to employers' liability insurance? Why should not the employers' liability companies develop a body of trained inspectors, precisely analogous to boiler inspectors, who would go from point to point making themselves familiar with operating conditions, recommend an improvement here, a new safety appliance there, warn the manager as to dangerous practices he is permitting, and, above all, make a lower rate for insurance of a plant well managed in this respect than for a similar one poorly managed?

The State inspectors in such States as have competent factory inspectors can do much, but the State is seldom able to carry on any function so well as private enterprise, once private enterprise sees where it can save money by efficiency. The Board of Underwriters have not, so far as known, dropped their inspectors in those States which have State fire wardens, nor is there any likelihood they will do so. Similarly there is no reason why the official work of the State factory inspector should not be assisted and supplemented by the work of the safety inspector of the employers' liability company. Such a plan would accomplish three objects:

First, and by far the most important, it would tend to diminish the most lamentable of all forms of suffering and death, those from industrial accidents.

Second, it would increase the stability and eventually the earning power of the employers' liability company itself.

Third, it would give to the safely and conscientiously managed plant and to its manager a well deserved advantage over their present position, as compared with the unscrupulous and the careless.

MANAGER.

### Automatic Reversing Trippers

*To the Editor.*—Our attention has just been called to an article on page 1437 of your December 22 number, which describes and illustrates an automatic reversing tripper which, according to the article, is made by the Stephens-Adamson Mfg. Company, Aurora, Ill.

This machine is described as a "new" automatic reversing tripper. Your article contains such a full and detailed description of the mechanism, that we are able to say with certainty that the device infringes every one of the 12 claims of our patent No. 673539 of May 7, 1901, covering a tripper invented by the late James B. Humphreys, who was for several years the chief engineer and description of the tripper referred to in your paper of this company. We ask you to examine the picture and satisfy yourself that there is not a single mechanical detail which is not fully shown and described in our patent of 10 years ago, which we enclose.

Our company has built hundreds of trippers under this patent, every one of which is plainly marked with the patent number. We have also had full sized machines of this type operating at all of the large world's fairs since the Paris Exposition of 1900, where we received the only Grand Prix which was awarded for conveying machinery. Furthermore, this same tripper is illustrated and described fully in our earlier catalogues. Therefore, we are compelled to attribute to audacity rather than to ignorance the claims made by

the Stephens-Adamson Company in your pages that it is offering a "new" automatic reversing tripper and that "there has been a great need in certain classes of work for a tripper of this sort."

Several years ago this company discontinued to some extent the use of the friction drive for moving the tripper and substituted, wherever it was possible, a mechanical equivalent which is absolutely dustproof, thereby saving our customers the expense of renewing the friction wheels; but the fact that we do not commonly employ a mechanical detail which was tried and found wanting offers no excuse for any one to use your pages in order to foist upon the public, as original and new, a device which has been patented for 10 years in every civilized country on the globe, and which has been advertised and sold in large numbers by the most prominent concern in its line of business.

The matter of infringement of our rights is one which we can look after with the help of our attorneys, but the damage, and particularly the annoyance, which we shall suffer from the article in your journal are serious matters. We are sure you will agree that such an article breeds other infringements and attracts trade away from those to whom it rightfully belongs. We, therefore, trust that you will give this letter as much prominence as was accorded in your columns to the article to which we have made objection.

ROBINS CONVEYING BELT COMPANY,

THOMAS ROBIN, President.

NEW YORK, January 23, 1911.

*To the Editor:* We are in receipt of yours of January 26th, inclosing copy of letter you have received from the Robins Conveying Belt Company, saying that the automatic reversing tripper manufactured by us and illustrated in your issue of December 22, is an infringement on the Humphreys patent of 1901, which that company claims to own. We wish to say that our machine is not an infringement of the Humphreys patent or any other patent; further, that our machine is a decided success, and we are prepared to demonstrate its superiority over any automatic tripper on the market. We certainly would not put a machine on the market unless we were prepared to demonstrate its efficiency, and our position in the conveying machinery line is sufficient to justify the statement.

Regarding the general tone of Mr. Robin's letter, we have no remarks to make whatever, and we trust you will publish his letter, together with our reply, because we are perfectly willing to let the public judge as to the record and present standing of the Stephens-Adamson Mfg. Company and the Robins Conveying Belt Company. We fully believe that the publicity of these letters will in no way harm us, and we trust it will do no harm to our competitors.

STEPHENS-ADAMSON MFG. COMPANY,

W. W. STEPHENS, President.

AURORA, ILL., January 28, 1911.

**Electric Iron and Steel in Norway.**—The Arendals Power Company, which owns the large Bøilefossen water falls in Norway, has increased its capital to \$1,000,000 and will engage in electric smelting of iron. These water falls will produce 30,000 hp. at average flow, and hydraulic development will give 12,000 hp. additional. The company also owns practically the whole mining district about the city of Arendal. Recently it acquired the right to use the patents owned by the Swedish Electrometal Company for producing iron and steel by means of electricity. The methods involved in these patents have been thoroughly tested at Trollhättan in Sweden and at Hardanger in Norway. The new works will be ready for operation in January, 1913.

The six blast furnaces and the Bessemer and open hearth steel plants of the Carnegie Steel Company's Ohio Works, Youngstown, Ohio, are now in full operation for the first time in some weeks. The upper and lower mills of the same company at Youngstown are running about four days a week.

## Steel Corporation Earnings in 1910

**Total for 1910 Was \$141,144,002, Against \$131,491,414 in 1909**

The statement of its earnings for the last quarter of 1910, just issued by the United States Steel Corporation, enables approximate figures for its total earnings of the year to be made up. Adding the results of the last quarter to those given for the previous quarter, the total is \$141,144,002, showing an increase of \$9,652,588 on the earnings of 1909. The figures for 1910 may be changed slightly upon completion of the audit of accounts for the year. The quarterly statement of earnings given below compares the last quarter of 1910 with the last quarter of 1909:

	1910.	1909.
October, earnings.....	\$10,512,130	\$14,048,205
November, earnings.....	8,228,857	13,711,765
December, earnings.....	7,249,991	13,211,339
Total after deducting all expenses incident to operations, including those for ordinary repairs and maintenance of plants, employees' bonus funds, and interest on bonds and fixed charges of the subsidiary companies....	\$25,990,978	\$40,971,309
Less charges and appropriations for the following:		
Sinking funds on bonds of subsidiary companies.....	\$410,430	\$438,914
Depreciation and reserve funds (regular provisions).....	5,118,088	6,131,963
	\$5,528,518	\$6,570,877
Net earnings.....	\$20,462,460	\$34,400,432
Deduct interest for the quarter on U. S. Steel Corporation bonds outstanding .....	\$5,816,640	\$5,880,324
Sinking funds for the quarter on U. S. Steel Corporation bonds—viz.:		
Installments .....	1,012,500	1,012,500
Interest on bonds in sinking funds .....	482,822	419,139
	\$7,311,962	\$7,311,963
Balance .....	\$13,150,498	\$27,088,469
Net adjustments in sundry accounts .....	83,766	562,874
	\$13,066,732	\$27,651,343
Dividend for the quarter on preferred stock, 1½ per cent. ....	\$6,304,919	\$6,304,919
Dividend for the quarter on common stock, 1½ per cent., 1910, and 1 per cent. and ¾ per cent. extra, 1909 .....	6,353,781	8,895,294
	\$12,658,700	\$15,200,213
Surplus for the quarter.....	\$408,032	\$12,451,130

The balance of the surplus carried forward from previous quarters in 1910 was \$16,520,687, which, added to \$408,032, makes a total of \$16,928,719. From this appropriations were made of \$5,000,000 for new plants, construction, &c., and \$1,000,000 for the reserve fund to cover advanced mining royalties, leaving \$10,928,719 for the balance of surplus for the year carried forward. The total appropriation for the year for new plants, construction, &c., was \$25,000,000.

**Eight-Hour Day for New York Machinists.**—National and local officers of the International Association of Machinists met in New Jersey January 29 with the general executive board, shop delegates and district chairman of District No. 15, to consider making a general demand for an eight-hour day in the district which takes in New York City and Hudson County, N. J. In November, 1910, the 15 lodges in District 15 and the affiliated Junior Order of Machinists decided by a referendum vote in favor of an eight-hour day demand. It is expected that it will be formally presented in March. At the meeting of January 29 a resolution was passed declaring for the eight-hour work day in automobile garages, general job-

bing, repair and machine shops and indorsing a general demand for a 50-hour working week in manufacturing shops, unless the straight eight-hour day as voted for in November is reaffirmed at a general mass meeting of employees of manufacturing shops.

**New Railroad Equipment.**—Recent railroad car inquiries include 500 hopper cars and 300 box cars for the Lehigh & New England, 400 freight cars for the Chicago, Indianapolis & Louisville, 1000 refrigerator cars for the American Refrigerator Transit Company, 500 steel under-frame cars for the Chicago, Burlington & Quincy and 50 to 75 tank cars for the Barrett Mfg. Company, Chicago. The Chicago Railway Company will build 215 passenger cars at its own shops. The Chesapeake & Ohio has ordered 25 coaches from the Pullman Company. The Argentine Government has placed 21 sleeping cars and 8 baggage cars in this country. The Chesapeake & Ohio has ordered 10 passenger locomotives from the American Locomotive Company, and the Grand Trunk has placed 12 locomotives and the Long Island 4 with the same company. The Algoma Central & Hudson Bay has ordered 10 locomotives from the Montreal Locomotive Works. The Missouri Pacific is reported to be about to close for 75 engines.

**The Detroit Foundry Supply Company.**—Important changes were made at the recent annual meeting of the Detroit Foundry Supply Company, Detroit, Mich. W. J. Woodison, whose long connection with the company as president and manager has made him well known to the trade throughout the Central West, retired and was succeeded as president and manager by W. Bruce Howard, a controlling stockholder. M. Z. Fox, formerly with the Hill & Griffith Company, Cincinnati, was elected vice-president, and R. S. Ray, secretary. The company has secured the services of J. H. Lyle as salesman to cover Illinois, Wisconsin and Iowa, and H. E. Moyer to cover Indiana, parts of Ohio and Canada. Mr. Woodison is considering a proposition to become sales manager of the Advance Machinery Company, Toledo, Ohio, maker of glue heaters, &c.

**The Detroit Steel Products Company.**—At the annual meeting of the Detroit Steel Products Company, Detroit, Mich., January 24, reports showed a large increase in the year's business in all departments. Directors were re-elected as follows: Henry N. Campbell, J. H. Avery, C. H. Heckler, John G. Rumney, Walter S. Russel, Henry Russel and Henry W. Dakin. Officers were elected as follows: Walter S. Russel, president; John G. Rumney, vice-president; Henry W. Dakin, treasurer, and H. E. Hade, secretary. The usual quarterly dividend of 1¼ per cent. was declared, and also an extra cash dividend of 3 per cent., making a total dividend for the year of 10 per cent.

**New York Central Ferrotitanium Rails.**—The rail orders of the New York Central Lines for 1911 as reported in these columns last week, amounting to 176,750 tons, include 41,500 tons of ferrotitanium Bessemer rails. The specifications for these call for the use of 1 per cent. of a 10 per cent. titanium alloy (or equivalent titanium), thus requiring for the order more than 400 tons of the 10 per cent. alloy. The strength of the titanium content in the alloy may be increased to 15 per cent., thus requiring a proportionately smaller quantity of alloy; but in any case the order is the largest ever placed for alloy steel rails.

The American Shipbuilding Company has received orders during the past week for three lake boats. One order is from the Wisconsin Steel Company for a 545-ft. freighter, to be used in the ore trade. It will be built in time for delivery early in the summer. It has not been decided where this boat will be built. The other two boats have been ordered by the Standard Oil Company. One will be an oil tank steamer and the other a barge. The length of each will be 260 ft. The steamer will be built at Detroit and the barge at Superior.



## The Crucible Steel Company Buys Midland

One of the largest deals in manufacturing plants that has occurred for some time was closed in Pittsburgh last week, being the purchase by the Crucible Steel Company of America of the entire property of the Midland Steel Company, located at Midland, Beaver County, Pa. The negotiations were handled by J. H. Hillman & Son, Oliver Building, Pittsburgh, dealers in pig iron, coke, ore and coal lands. Herbert Du Puy, chairman of the Crucible Steel Company of America, has issued an official statement regarding the purchase, which is as follows:

The Crucible Steel Company of America has entered into a contract with the owners of the Midland Steel Company for the purchase of the plant of that company at Midland, Beaver County, Pa. The property consists of 423 acres of level land adjoining the Ohio River, and above the highest high water stage, and is admirably suited for manufacturing purposes and of sufficient size to permit of almost indefinite expansion.

The owners of the property have erected upon it one blast furnace of the most modern type, with a capacity of 480 tons of pig iron per day; foundations and underground connections and equipment for a second furnace of the same size; 250 beehive coke ovens; a large modern ore bridge with a capacity sufficient to take care of the supply for two furnaces; a river coal hoist, piers and landing; water works of sufficient capacity to take care not only of the present plant, but of one of double its capacity; machine shops, electric plant, pig casting machine, and all other necessary buildings and workshops required about a modern blast furnace plant. All of these improvements are practically new and of the most approved design and, including the value of the land, could not be reproduced for a sum less than \$3,500,000.

In addition to this, the company has purchased from the owners of the Midland Steel Company all the capital stock of the Midland Limestone Company, which owns a tract of 418 acres of surface and 130 acres of limestone, located at Walford Station, in Lawrence County, Pa., upon which is erected a crusher having a capacity of 1000 tons per day. As a further addition to this plant, there is included some 2000 acres of coal lands located directly opposite on the south side of the Ohio River, and so close to the point of operations that it is proposed to carry the coal by buckets directly from the mouth of the mine across the river to the plant.

This property is served by the Pennsylvania Lines and has slack water navigation.

We propose to erect upon this property a modern open hearth plant for the production of high grade open hearth steels, such as are now being made at the other plants of the company. This plant will consist of eight 60-ton standard and one tilting open hearth furnaces and also an electric furnace forming part of the plant; a modern blooming mill with the latest mechanism for its operation, and a billet mill sufficient to take care of the capacity of the open hearth department, all of which will be operated with the latest improvements of labor saving mechanisms. The development of this plant has been necessary owing to the inability of the company to produce a sufficient capacity of high grade steel at its present works to take care of its rapidly growing trade. It is also proposed to erect a modern mill for the production of agricultural shapes sufficient to take care of the requirements of the country. These improvements, when completed, will cost \$5,000,000.

We have incorporated the Pittsburgh Crucible Steel Company, which will take title to all these properties with all the improvements mentioned, all of which capital stock is owned by the Crucible Steel Company of America. The Pittsburgh Crucible Steel Company has authorized an issue of bonds aggregating \$7,500,000 par value, dated March 1, 1911, bearing interest at the rate of 5 per cent. per annum, free of tax, and maturing in 30 annual installments of \$250,000 each, the first of which shall become due March 1, 1916, and annually thereafter.

These bonds are secured by a first mortgage on all the property and franchises of the Pittsburgh Crucible Steel Company now owned or that may hereafter be acquired, and are guaranteed absolutely as to principal and interest by the Crucible Steel Company of America. In this guarantee the Crucible Steel Company of America covenants that, until \$3,750,000 par value of the bonds so guaranteed shall have been paid, its quick current assets shall at all times be one and one-half times its liabilities, including all guarantees and other indirect liabilities of every nature, but not including guarantees heretofore made by it of the bonds of the St. Clair Steel Company, the St. Clair Furnace Company and the Clairton Steel Company, properties now owned by the United States Steel Corporation, and whose bonds are now guaranteed by it, a large proportion of which bonds have already matured and been paid; also not including the guarantee of \$45,000 per annum interest upon bonds of the Norwalk Steel Company, a company owned by the Crucible Steel Company of America.

After \$3,750,000 of the bonds of the Pittsburgh Crucible Steel Company have been retired, and until the remainder have matured and been paid, the quick current assets of the Crucible Steel Company shall equal the liabilities of the company.

The Crucible Steel Company of America also covenants, as part of its guarantee, that until the bonds of the Pittsburgh Crucible Steel Company so guaranteed by it shall have been paid and retired, it will neither create, nor suffer to be created, any mortgage, lien or other incumbrance upon any of its properties, nor issue any scrip in lieu of dividends.

The mortgage of the Pittsburgh Crucible Steel Company and the guarantee of the Crucible Steel Company of America provide that the entire proceeds of this issue of bonds shall be expended only upon the property covered by the lien of the mortgage and its betterment and improvement.

It is the intention of the Crucible Steel Company to eventually move the open hearth plant now at its Park Works to Midland. It is also probable that in time the Park and Crescent works of the Crucible Steel Company, now located in Pittsburgh, will be moved to Midland, but no plans for this have yet been made. The purchase is regarded on all sides as a splendid one for the Crucible Steel Company and will make its position much stronger than it has ever been. Eventually the company will manufacture its entire supply of pig iron and billets at Midland, freeing it from the necessity of purchasing in the open market.

## Steel Corporation Changes

At the meeting of the Board of Directors of the United States Steel Corporation, held January 31, Thomas Morrison, Pittsburgh, tendered his resignation as a member of the board. James A. Farrell was elected to fill the vacancy thus created. The resignation of W. E. Corey as president was accepted and James A. Farrell was elected to succeed him. Mr. Farrell entered upon the duties of the office February 1. He becomes ex-officio a member of the Finance Committee, of which the other members are Chairman Gary, George F. Baker, George W. Perkins, H. C. Frick, Norman B. Ream, J. Pierpont Morgan, Jr., and P. A. B. Widener. Mr. Corey continues as a director of the corporation.

After the meeting of January 31 Chairman Gary made the following statement concerning business conditions: "The reports of the general managers of sales, which we get weekly, are all very favorable, more so than at any time during the last six months. Our last daily report of bookings is of January 27, and including that day the bookings per day for the month of January are over 30,000 tons, exclusive of the large orders for rails which we have been receiving during the last few days and which are not yet reported. This compares with 22,000 tons per day in December and a similar amount for November. The tin plate, wire and export business are very active. In all lines there is a marked improvement."

## E. P. Thomas President of the United States Steel Products Company

At a meeting of the board of directors of the United States Steel Products Company on January 27 Eugene P. Thomas was elected president, to succeed James A. Farrell, who became president of the United States Steel Corporation on February 1.

Mr. Thomas was born in Atlanta, Ga., and started in the steel business there in 1892 with the Johnson Company, now the Lorain Steel Company, one of the subsidiary companies of the United States Steel Corporation. In 1899 he went abroad for that company, representing it in London for four years, the company maintaining London offices jointly with the American Steel & Wire Company and the Illinois Steel Company. In 1903, on the formation of the United States Steel Products Export Company, headed by James A. Farrell, Mr. Thomas returned to New York to take charge of one of the departments, and for several years has been chief assistant to Mr. Farrell.

# The Iron and Metal Markets

## A Comparison of Prices

Advances Over the Previous Week in Heavy Type,  
Declines in Italics.

At date, one week, one month and one year previous.

	Feb. 1, 1911.	Jan. 25, 1911.	Jan. 4, 1911.	Feb. 2, 1910.
<b>PIG IRON, Per Gross Ton:</b>				
Foundry No. 2, standard, Phila- delphia .....	\$15.50	\$15.50	\$15.50	\$18.75
Foundry No. 2, Southern, Cincin- nati .....	14.25	14.25	14.25	17.25
Foundry No. 2, Birmingham, Ala. ....	11.00	11.00	11.00	14.00
Foundry No. 2, local, Chicago....	15.50	15.50	15.50	19.00
Basic, delivered, eastern Pa....	14.25	14.25	14.75	18.50
Basic, Valley furnace.....	13.25	13.25	13.25	16.50
Bessemer, Pittsburgh.....	15.90	15.90	15.90	19.90
Gray forge, Pittsburgh.....	14.15	14.15	13.90	17.15
Lake Superior charcoal, Chicago	17.50	17.50	18.00	19.50
<b>BILLETS, &amp;c., Per Gross Ton:</b>				
Bessemer billets, Pittsburgh....	23.00	23.00	23.00	27.50
Forging billets, Pittsburgh.....	28.00	28.00	28.00	31.00
Open hearth billets, Philadelphia	25.40	25.40	25.40	30.60
Wire rods, Pittsburgh.....	28.00	28.00	28.00	33.00
<b>OLD MATERIAL, Per Gross Ton:</b>				
Iron rails, Chicago.....	14.50	14.50	15.50	20.00
Iron rails, Philadelphia.....	17.00	17.00	17.00	20.50
Car wheels, Chicago.....	13.00	13.00	13.00	18.00
Car wheels, Philadelphia.....	13.00	13.00	13.00	17.00
Heavy steel scrap, Pittsburgh....	13.50	13.50	13.50	17.50
Heavy steel scrap, Chicago.....	11.50	11.50	11.50	16.00
Heavy steel scrap, Philadelphia	12.50	12.50	12.50	17.00
<b>FINISHED IRON AND STEEL,</b>				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Bessemer steel rails, heavy, at mill .....	1.25	1.25	1.25	1.25
Refined iron bars, Philadelphia....	1.30	1.32½	1.32½	1.65
Common iron bars, Chicago.....	1.30	1.30	1.30	1.60
Common iron bars, Pittsburgh....	1.35	1.35	1.35	1.70
Steel bars, tidewater, New York	1.56	1.56	1.56	1.66
Steel bars, Pittsburgh.....	1.40	1.40	1.40	1.50
Tank plates, tidewater, New York	1.56	1.56	1.56	1.71
Tank plates, Pittsburgh.....	1.40	1.40	1.40	1.55
Beams, tidewater, New York....	1.56	1.56	1.56	1.71
Beams, Pittsburgh.....	1.40	1.40	1.40	1.55
Angles, tidewater, New York....	1.56	1.56	1.56	1.71
Angles, Pittsburgh.....	1.40	1.40	1.40	1.55
Skelp, grooved steel, Pittsburgh.	1.30	1.25	1.25	1.50
Skelp, sheared steel, Pittsburgh.	1.35	1.30	1.30	1.60
<b>SHEETS, NAILS AND WIRE,</b>				
Per Pound:	Cents.	Cents.	Cents.	Cents.
Sheets, black, No. 28, Pittsburgh	2.20	2.20	2.20	2.40
Wire nails, Pittsburgh*.....	1.75	1.75	1.70	1.85
Cut nails, Pittsburgh.....	1.60	1.60	1.60	1.80
Barb wire, galv., Pittsburgh*....	2.05	2.05	2.00	2.15
<b>METALS, Per Pound:</b>				
Lake copper, New York.....	12.75	12.75	13.00	13.87½
Electrolytic copper, New York....	12.37½	12.37½	12.75	13.62½
Spelter, New York.....	5.55	5.55	5.55	6.12½
Spelter, St. Louis.....	5.40	5.40	5.40	5.90
Lead, New York.....	4.50	4.50	4.50	4.70
Lead, St. Louis.....	4.32	4.35	4.35	4.60
Tin, New York.....	42.75	43.25	39.55	32.60
Antimony, Hallett, New York....	7.75	7.25	7.55	8.25
Tin plate, 100-lb. box, New York	\$3.84	\$3.84	\$3.84	\$3.84

\* These prices are for largest lots to jobbers.

## Prices of Finished Iron and Steel f.o.b. Pittsburgh

Freight rates from Pittsburgh in carloads, per 100 lb.: New York, 16c.; Philadelphia, 15c.; Boston, 18c.; Buffalo, 11c.; Cleveland, 10c.; Cincinnati, 15c.; Indianapolis, 17c.; Chicago, 18c.; St. Paul, 32c.; St. Louis, 22½c.; New Orleans, 30c.; Birmingham, Ala., 45c. Rates to the Pacific Coast are 80c. on plates, structural shapes and sheets, No. 11 and heavier; 85c. on sheets, Nos. 12 to 16; 95c. on sheets, No. 16 and lighter; 65c. on wrought boiler tubes.

**Structural Material.**—I-beams and channels, 3 to 15 in., inclusive, 1.40c. to 1.45c., net; I-beams over 15 in., 1.50c. to 1.55c., net; H-beams over 8 in., 1.55c. to 1.60c.; angles, 3 to 6 in., inclusive, ¼ in. and up, 1.40c. to 1.45c., net; angles over 6 in., 1.50c. to 1.55c., net; angles, 3 in., on one or both legs, less than ¼ in. thick, 1.45c., plus full extras as per steel bar card, effective September 1, 1909; tees, 3 in. and up, 1.45c., net; tees, 3 in. and up, 1.40c. to 1.45c., net; angles, channels and tees, under 3 in., 1.45c., base, plus full extras as per steel bar card of September 1, 1909; deck

beams and bulb angles, 1.70c. to 1.75c., net; hand rail tees, 2.50c.; checkered and corrugated plates, 2.50c., net.

**Plates.**—Tank plates, ¼ in. thick, 6¼ in. up to 100 in. wide, 1.40c. to 1.45c., base. Following are stipulations prescribed by manufacturers, with extras to be added to base price (per pound) of plates:

Rectangular plates, tank steel or conforming to manufacturers' standard specifications for structural steel dated February 6, 1903, or equivalent, ¼ in. thick and over on thinnest edge, 100 in. wide and under, down to but not including 6 in. wide, are base.

Plates up to 72 in. wide, inclusive, ordered 10.2 lb. per square foot are considered ¼ in. plates. Plates over 72 in. wide must be ordered ¼ in. thick on edge, or not less than 11 lb. per square foot, to take base price. Plates over 72 in. wide ordered less than 11 lb. per square foot down to the weight of 3-16 in. take the price of 3-16 in.

Allowable overweight, whether plates are ordered to gauge or weight, to be governed by the standard specifications of the Association of American Steel Manufacturers.

Gauges under ¼ in. to and including 3-16 in. on thinnest edge.....	\$0.10
Gauges under 3-16 in. to and including No. 8.....	.15
Gauges under No. 8 to and including No. 9.....	.25
Gauges under No. 9 to and including No. 10.....	.30
Gauges under No. 10 to and including No. 12.....	.40
Sketches (including all straight taper plates), 3 ft. and over in length.....	.10
Complete circles, 3 ft. in diameter and over.....	.20
Boiler and flange steel.....	.10
"A. B. M. A." and ordinary firebox steel.....	.20
Still bottom steel.....	.30
Marine steel.....	.40
Locomotive firebox steel.....	.50
Widths over 100 in. up to 110 in., inclusive.....	.05
Widths over 110 in. up to 115 in., inclusive.....	.10
Widths over 115 in. up to 120 in., inclusive.....	.15
Widths over 120 in. up to 125 in., inclusive.....	.25
Widths over 125 in. up to 130 in., inclusive.....	.50
Widths over 130 in.....	1.00
Cutting to lengths or diameters under 3 ft. to 2 ft., inclusive.....	.25
Cutting to lengths or diameters under 2 ft. to 1 ft., inclusive.....	.50
Cutting to lengths or diameters under 1 ft.....	1.55
No charge for cutting rectangular plates to lengths 3 ft. and over.	

TERMS.—Net cash 30 days.

**Sheets.**—Makers' prices for mill shipments on sheets in carload and larger lots, on which jobbers charge the usual discounts for small lots from store, are as follows: Blue annealed sheets, Nos. 3 to 8, U. S. standard gauge, 1.55c.; Nos. 9 and 10, 1.65c.; Nos. 11 and 12, 1.70c.; Nos. 13 and 14, 1.75c.; Nos. 15 and 16, 1.85c. One pass, cold rolled, box annealed sheets, Nos. 10 to 12, 1.85c.; Nos. 13 and 14, 1.90c.; Nos. 15 and 16, 1.95c.; Nos. 17 to 21, 2c.; Nos. 22, 23 and 24, 2.05c.; Nos. 25 and 26, 2.10c.; No. 27, 2.15c.; No. 28, 2.20c.; No. 29, 2.25c.; No. 30, 2.35c. Three pass cold roll sheets, box annealed, are as follows: Nos. 15 and 16, 2.05c.; Nos. 17 to 21, 2.10c.; Nos. 22 to 24, 2.15c.; Nos. 25 and 26, 2.20c.; No. 27, 2.25c.; No. 28, 2.30c.; No. 29, 2.35c.; No. 30, 2.45c. Galvanized sheets, Nos. 10 and 11, black sheet gauge, 2.20c.; Nos. 12, 13 and 14, 2.30c.; Nos. 15, 16 and 17, 2.45c.; Nos. 18 to 22, 2.60c.; Nos. 23 and 24, 2.70c.; Nos. 25 and 26, 2.90c.; No. 27, 3.05c.; No. 28, 3.20c.; No. 29, 3.30c.; No. 30, 3.50c. Painted roofing sheets, No. 28, \$1.55 per square. Galvanized sheets, No. 28, \$2.75 per square for 2½ in. corrugations. All above prices are f.o.b. Pittsburgh, terms 30 days net, or 2 per cent. cash discount 10 days from date of invoice.

**Wrought Pipe.**—The following are the jobbers' carload discounts on the Pittsburgh basing card on wrought pipe, in effect from October 1:

### "Butt Weld.

	Steel. Black. Galv.	Iron. Black. Galv.
¼, ½, ¾ in.....	72 58	68 54
1 in.....	75 63	71 59
1½ to 1¾ in.....	79 69	75 65
2 to 3 in.....	80 70	76 66
Lap Weld.		
2 in.....	76 66	72 62
2½ to 4 in.....	78 68	74 64
4½ to 6 in.....	77 67	73 63
7 to 12 in.....	75 65	71 55
13 to 15 in.....	51½	..
Butt Weld, extra strong, plain ends, card weights.		
¼, ½, ¾ in.....	69 59	65 55
1 in.....	74 68	70 64
1½ to 1¾ in.....	78 72	74 68
2 to 3 in.....	79 73	75 69
Lap Weld, extra strong, plain ends, card weight.		
2 in.....	75 65	71 67
2½ to 4 in.....	77 71	73 67
4½ to 6 in.....	76 70	72 66
7 to 8 in.....	69 59	65 55
9 to 12 in.....	64 54	60 50
Butt Weld, double extra strong, plain ends, card weight.		
¼ in.....	64 58	60 54
¾ to 1¼ in.....	67 61	63 57
2 to 3 in.....	69 63	65 59
Lap Weld, double extra strong, plain ends, card weight.		
2 in.....	65 59	61 55
2½ to 4 in.....	67 61	63 57
4½ to 6 in.....	66 60	62 56
7 to 8 in.....	59 49	55 45



# THE IRON AND METAL MARKETS

## Plugged and Reamed.

1 to 1½, 2 to 3 in. Butt Weld { Will be sold at two (2) points lower basing (higher price) than merchant or card weight pipe, Butt or Lap Weld as specified. The above discounts are for "card weight," subject to the usual variation of 5 per cent. Prices for less than carloads are three (3) points lower basing (higher price) than the above discounts.

**Boiler Tubes.**—Discounts on lap welded steel and charcoal iron boiler tubes to jobbers in carloads are as follows:

	Steel.	Iron.
1 to 1½ in. ....	49	43
1½ to 2¼ in. ....	61	43
2½ in. ....	63	48
2½ to 5 in. ....	69	55
2½ in. and smaller, over 18 ft., 10 per cent. net extra.		
2½ in. and larger, over 22 ft., 10 per cent. net extra.		
Less than carloads to destinations east of the Mississippi River will be sold at delivered discounts for carloads lowered by two points, for lengths 22 ft. and under; longer lengths, f.o.b. Pittsburgh.		

**Wire Rods.**—Bessemer rods, \$28; open hearth and chain rods, \$28.

**Steel Rivets.**—Structural rivets, ¾ in. and larger, 1.90c., base; cone head boiler rivets, ¾ in. and larger, 2c., base; ¾ in. and 11-16 in. take an advance of 15c., and ½ in. and 9-16 in. take an advance of 50c.; in lengths shorter than 1 in. also take an advance of 50c. Terms are 30 days, net cash, f.o.b. mill.

## Pittsburgh

PARK BUILDING, February 1, 1911.—(By Telegraph.)

**Pig Iron.**—The Standard Sanitary Mfg. Company has bought upward of 5000 tons of Northern No. 2 foundry for its New Brighton and Pittsburgh works and is in the market for 3000 to 4000 tons of Southern for its Louisville plant. Prices paid for the Northern No. 2 foundry are understood to have ranged from \$13.50 to \$13.75 and possibly \$14, Valley furnace, for a small part of the iron. Most furnaces are now quoting Northern No. 2 foundry firm at \$13.75 and some are asking \$14, at furnace. Valley furnaces continue to quote Bessemer at \$15, but a local dealer has 4000 to 5000 tons which he secured in exchange for basic, and which he will sell at \$14.75, Valley furnace, or lower. Malleable Bessemer is a little firmer, and sales have been made as high as \$13.75, Valley furnace. A local interest is credited with having bought recently 4000 to 5000 tons of forge iron at about \$13, Valley furnace, for delivery over the next six months, but the furnaces are now quoting \$13.25. We quote Bessemer iron nominally at \$15; malleable Bessemer, \$13.75; basic, \$13.25 to \$13.50; No. 2 foundry, \$13.75, and gray forge, \$13.25, all at Valley furnace, the freight rate to the Pittsburgh district being 90c. a ton.

**Steel.**—Mills report that specifications against contracts for billets and sheet and tin bars were heavier in January than in December, especially for tin bars. The new demand is only for small lots as nearly all regular consumers of steel are covered by special contracts. The market is firm. We quote Bessemer and open hearth billets, 4 x 4 in. and up to, but not including, 10 x 10 in., at \$23, base, and sheet and tin bars in 30-ft. lengths, \$24, f.o.b. Pittsburgh or Youngstown, full freight to destination added. We quote 1½-in. billets at \$24 and forging billets at \$28, base, usual extras for sizes and carbons, f.o.b. Pittsburgh or Youngstown districts, freight to destination added.

(By Mail.)

The general feeling in the trade is much better, and it is backed up by actual orders. Specifications sent to the mills in January were heavier than in December, and the outlook for the near future is regarded as very encouraging. A number of plants that heretofore have been working three or four days a week are this week on full time. Quite a good deal of tonnage of pig iron is being quietly sold, and furnaces and dealers are more encouraged than for some time. While there is little actual demand for Bessemer pig, it is firm, at \$15, at furnace. There has been some movement in malleable Bessemer, and while one seller has been quoting as low as \$13.50, at Valley furnace, sales are reported as high as \$13.75. A local interest has bought in the past week upward of 4000 tons of No. 2 foundry iron at prices ranging from \$13.75 to \$14, at Valley furnace. This consumer bought some foundry iron early in January at \$13.50, at furnace, and later tried to cover his requirements for the last half of the year at the same price, but could not do so, having to pay as high as \$14 for certain brands of No. 2. There is not much inquiry for forge iron, but Valley furnaces are quoting \$13.25, at furnace. Nearly all consumers of billets, sheet and tin bars are covered on sliding scale contracts, against which they are specifying quite freely, but very little new business is being placed. In finished material there has been noticeable improvement in new orders for structural steel, plates and steel bars. A

great deal of business is pending in structural material and some good sized contracts have been closed. Further business from the railroads in steel cars and other equipment is expected in the near future, and it is believed the railroads will be heavier buyers of material this year than they were in 1910.

**Ferromanganese.**—The market is weak and sales of limited tonnage that had to be moved are reported as low as \$37.75, Baltimore. We quote 80 per cent. foreign at \$38, Baltimore, for prompt shipment, and note sales of 75 to 100 tons to consumers for prompt delivery at that price. The freight rate to Pittsburgh from Baltimore is \$1.95 a ton.

**Ferrosilicon.**—Prices are a little firmer, and a sale of about 25 tons is noted to a consumer on the basis of close to \$56, Pittsburgh. Quotations on 50 per cent. ferrosilicon for prompt shipment are \$55.50 to \$56, Pittsburgh. We quote 10 per cent. blast furnace silicon at \$23; 11 per cent. \$24 and 12 per cent. \$25, f.o.b. cars, Jisco and Ashland furnaces.

**Skelp.**—The market is firmer and sales of grooved steel skelp at 1.25c. are hard to find, nearly all makers quoting 1.30c. We quote grooved steel skelp at 1.30c., sheared steel skelp, 1.35c.; grooved iron skelp, 1.60c. to 1.65c., and sheared iron skelp, 1.70c. to 1.75c., all for delivery at consumers mills in the Pittsburgh district, usual terms.

**Muck Bar.**—Practically no muck bar is being made in the Pittsburgh district for the open market, all the mills making muck bar here using their entire output. We quote best grades of muck bar made from all pig iron at nominally \$29, Pittsburgh.

**Sheets.**—Another meeting of sheet steel makers was held in the Fort Pitt Hotel, this city, on Wednesday, January 25, at which J. A. Campbell, president of the Youngstown Sheet & Tube Company, presided. Reports made to the meeting were to the effect that the demand is slightly better and prices are being more firmly held than for some time. Specifications against contracts are reported as fair, with the outlook that they will be heavier in February or March. The American Sheet & Tin Plate Company has started up three of its 23 hot sheet mills in the Aetna-Standard Works at Bridgeport, Ohio. The full schedule of prices now in effect on the various grades of sheets is printed on a previous page.

**Tin Plate.**—The American Sheet & Tin Plate Company is now operating close to 80 per cent. of its tin plate capacity, having recently started up 16 of the 23 hot tin mills in its Laughlin Works at Wheeling, W. Va. The high rivers this week necessitated closing down its Demmler, McKeesport and Monongahela works, but this will only be temporary. Specifications against contracts are reported as coming in quite freely, but new demand is somewhat quiet. We quote 100-lb. cokes at \$3.60 per base box, f.o.b. Pittsburgh.

**Steel Rails.**—The Carnegie Steel Company has taken a contract for 9800 tons of standard rails from the Western Maryland Railroad. The Edgar Thomson mills at Bessemer are now better supplied with orders for standard sections and also for light rails than for some time. Fair sized orders for light rails continue to be placed, most of the business coming from coal mining interests. Quotations on light rails are as follows: 12-lb. rails, 1.25c.; 16, 20 and 25 lb., 1.21c. to 1.25c.; 30 and 35 lb., 1.20c., and 40 and 45 lb., 1.16c. The prices are f.o.b. at mill, plus freight, and are the minimum of the market on carload lots, small lots being sold at a little higher price. We quote standard sections at 1.25c. per lb.

**Plates.**—No large orders for plates have come out in the past week nor have any important orders for cars been placed. The Standard Steel Car Company has received contracts for 300 all steel underframe cars from one of the Western roads. Prices on plates continue firm and we quote ¾ in. and heavier at 1.40c., Pittsburgh.

**Structural Material.**—More inquiry is reported than for some months and some large contracts have been placed. The McClintic-Marshall Construction Company has received a contract for about 3000 tons of structural steel for new buildings for the immense plant of the Ford Plate Glass Company, at Rossford, near Toledo, Ohio. The main building will be 195 x 980 ft., and there will be 15 smaller buildings. Some other large jobs are in sight that will likely be placed in the very near future. Prices are firm and we continue to quote beams and channels up to 15-in. at 1.40c., Pittsburgh.

**Bars.**—Steel bar mills report that specifications from the implement makers and wagon builders and for concrete purposes are coming in quite freely. The new demand is light. Railroads are buying more freely of iron bars and are specifying more liberally against contracts. The market is firm and we continue to quote steel bars at 1.40c. and iron bars at 1.35c., f.o.b. Pittsburgh.

**Hoops and Bands.**—Some good sized contracts for

## THE IRON AND METAL MARKETS

bands have recently been placed and it is stated that on very desirable specifications, 1.35c., Pittsburgh, has recently been done. The demand for hoops is fair and specifications against large contracts placed in November and December are coming in quite freely. We quote hoops at 1.50c. and bands at 1.40c., in carload and larger lots, the latter carrying extras as given in the steel bar card of September 1, 1909.

**Spikes.**—Effective February 1, the spike makers adopted a new schedule of prices and now charge the same for the smaller sized railroad spikes as for the larger size, wiping out a former differential of 10c. per keg in favor of the smaller size. The new prices, effective from February 1, are as follows:

### Railroad Spikes.

4 1/2, 5 and 5 1/2 x 3/16.....	Extra	1.05
3 1/2, 4, 4 1/2 and 5 x 1/2.....	Extra	.10
2 1/2, 4 and 4 1/2 x 3/16.....	Extra	.20
3 1/2, 4 and 4 1/2 x 3/8.....	Extra	.30
2 1/2 x 3/8.....	Extra	.40
2 1/2, 3 and 3 1/2 x 3/16.....	Extra	.60
2 x 3/16.....	Extra	.80

### Boat Spikes.

3/4 in. square, 12 to 24 in. long.....	Extra	.15
5/8 in. square, 8 to 16 in. long.....	Extra	.15
1/2 in. square, 6 to 16 in. long.....	Extra	.15
7/16 in. square, 6 to 12 in. long.....	Extra	.20
3/8 in. square, 4 to 12 in. long.....	Extra	.39
3/16 in. square, 4 to 8 in. long.....	Extra	.45
1/4 in. square, 4 to 8 in. long.....	Extra	.75
1/4 in. square, 3 to 3 1/2 in. long.....	Extra	1.00
3/8 and 3/16 shorter than 4 in., 1/4 cent extra.		

**Spelter.**—The market has quieted down and prices have gone off. We now quote prime grades of Western at 5.25c. and 5.27 1/2c., East St. Louis, equal to 5.37 1/2c. and 5.40c., Pittsburgh.

**Merchant Steel.**—The demand continues light and specifications against contracts are only fair, but shipments by the mills in January showed a slight increase over December. It is stated that shafting discounts are being fairly well maintained and on cold rolled steel shafting are 57 per cent. off in carload and larger lots, and 52 per cent. in small lots, delivered in base territory.

**Rivets.**—Trade continues quiet and the demand is still for small lots only. Consumers are not specifying very freely against contracts, but prices are fairly well maintained.

**Wire Products.**—Only small orders for wire and wire nails have been placed since the advance in prices, which went into effect January 20, the large trade having covered its requirements before the advance was made. The demand for cut nails is fair, but prices are a shade firmer. We quote galvanized barb wire at \$2.05, painted \$1.75, annealed fence wire \$1.55, galvanized \$1.85, wire nails \$1.75 and cut nails \$1.60, in carload and larger lots, all f.o.b. Pittsburgh, full freight to point of delivery added.

**Merchant Pipe.**—Several very large projects for gas and oil lines are being talked about, but are not yet far enough along to be mentioned. The demand for merchant pipe is about as heavy as usual at this season. Discounts on iron and steel pipe are being quite well maintained.

**Iron and Steel Scrap.**—There is a decidedly better feeling in the scrap trade, new inquiry being heavier, and dealers are firmer in their ideas as to prices. Consumers are willing to contract ahead for the next four or six months at present prices, but dealers are not disposed to sell at this level, except for prompt delivery, believing that the market will be higher in the very near future. There has been a heavy movement recently in bundled sheet scrap and prices are decidedly firmer. We note a sale of about 1500 tons of heavy steel scrap at about \$13.75, Monessen, Pa. Dealers quote about as follows, per gross ton, f.o.b. Pittsburgh or elsewhere, as noted:

Heavy steel scrap, Steubenville, Fol-lansbee, Sharon, Monessen and Pitts-burgh delivery.....	\$13.50 to \$13.75
No. 1 foundry cast.....	13.00 to 13.25
No. 2 foundry cast.....	12.00 to 12.25
Bundled sheet scrap, at point of ship-ment.....	10.00 to 10.25
Rerolling rails, Newark and Cambridge, Ohio, and Cumberland, Md.....	14.75 to 15.00
No. 1 railroad malleable stock.....	12.75 to 13.00
Grate bars.....	10.75 to 11.00
Low phosphorus melting stock.....	17.00 to 17.25
Iron car axles.....	24.00 to 24.50
Steel car axles.....	20.25 to 20.50
Locomotive axles.....	24.00 to 24.50
No. 1 bushing scrap.....	12.25 to 12.50
No. 2 bushing scrap.....	8.75 to 9.00
Old car wheels.....	13.50 to 13.75
Sheet bar crop ends.....	15.75 to 16.00
Cast iron borings.....	8.00 to 8.10
Machine shop turnings.....	8.60 to 8.75
Old iron rails.....	16.00 to 16.25
No. 1 wrought scrap.....	14.50 to 14.75
Heavy steel axle turnings.....	10.25 to 10.50

**Boiler Tubes.**—Several large inquiries for boiler tubes are in the market and will likely be closed in the very near

future. The demand for merchant tubes continues light, and prices are still more or less shaded.

**Coke.**—There are no new large inquiries for either fur-nace or foundry coke. The market is still suffering from overproduction, and not much betterment in either prices or demand can be expected until the output is materially cut down. The production in the Upper and Lower Con-nellsville regions last week was 287,475 net tons, an in-crease over the previous week of a little over 7000 tons. We quote standard makes of furnace coke for spot shipment at \$1.45 to \$1.55 per net ton, at oven, while on contracts for delivery over the year from \$1.70 to \$1.75 is being quoted by some coke operators, while others, that are pretty well filled up, are holding their furnace coke firm at \$1.90 to \$2, at oven. Best makes of 72-hour foundry coke are being held at \$2.10 to dealers and from \$2.25 up to \$2.50, at oven, to consumers.

## Chicago

FISHER BUILDING, February 1, 1911.—(By Telegraph.)

Western railroads have adopted a more liberal buying policy within the last week. The Chicago, Burlington & Quincy has bought 30,000 tons of rails, 10,000 tons each from the Illinois, Lackawanna and Colorado companies, and several other roads have placed 10,000-ton orders for early requirements. Malleable foundries which do railroad work are figuring on contracts for deliveries covering a year from July 1, although the railroads have not yet specified the full tonnage bought last year. Structural business is improving steadily and the fabricators are getting better prices than a week ago. Mill prices on structural material are very firm and conditions may soon justify an advance similar to the recent advance in wire products. The wire interests obtained immediate results by this policy. Their trade was lagging on account of hesitation among both jobbers and manufacturers, but specifications for wire are now running in excess of mill capacity and hardware jobbers look for another advance within a few weeks. Outside of railroad buy-ing, structural work and wire products, improvement is slow but encouraging. There are no reports of the leading mills increasing their operations, but if the improvement of the past week continues another week more furnace and mill capacity will be brought in. The scrap market reflects im-provement in conditions.

**Pig Iron.**—The malleable foundries are inquiring for round lots of malleable Bessemer iron for delivery during the last half, as they are figuring on railroad contracts for the next fiscal year in this trade. The market for malleable Bessemer has been badly congested, owing to the fact that the railroads and railroad equipment industries have not given specifications for castings purchased for the current trade year. This leaves the foundries with large stocks of high priced iron, which they bought a year ago, many of the foundries having enough iron on hand or due them to cover their requirements for the first half of this year. Aside from these malleable inquiries, the market is quiet. The foundries are not buying except in small lots to even up their stocks, and local furnaces are reluctant to sell for further than prompt shipment. This condition also applies to Southern iron. The high phosphorus grades of Southern iron are selling below \$11, and \$10.50, Birmingham, could be done on any round lot for prompt shipment, but no transactions of any magnitude are reported on this basis. Alabama brands are held nominally at \$11 with no inquiries of moment to test the market. The leading Southern inter-ests are holding back on sales for forward delivery, ex-pressing confidence in an early improvement in the demand. The following quotations are for February and March shipment, Chicago delivery:

Lake Superior charcoal.....	\$17.50 to \$18.00
Northern coke foundry, No. 1.....	16.00 to 16.50
Northern coke foundry, No. 2.....	15.50 to 16.00
Northern coke foundry, No. 3.....	15.25 to 15.75
Northern Scotch, No. 1.....	16.50 to 17.00
Southern coke, No. 1.....	15.85 to 16.35
Southern coke, No. 2.....	15.35 to 15.85
Southern coke, No. 3.....	15.10 to 15.60
Southern coke, No. 4.....	14.85 to 15.35
Southern coke, No. 1 soft.....	15.85 to 16.35
Southern coke, No. 2 soft.....	15.35 to 15.85
Southern gray forge.....	14.60 to 15.10
Southern mottled.....	14.60 to 15.10
Malleable Bessemer.....	15.50 to 16.00
Standard Bessemer.....	17.40 to 17.90
Jackson Co. and Kentucky silvery, 6%.....	17.90 to 18.40
Jackson Co. and Kentucky silvery, 8%.....	18.90 to 19.40
Jackson Co. and Kentucky silvery, 10%.....	19.90 to 20.40

(By Mail.)

**Billets.**—The Illinois Steel Company has made a sale of 15,000 tons of open hearth rolling billets to a Canadian steel manufacturing interest. On an inquiry last week for 500 tons of forging billets Eastern mills quoted below \$29, Chicago, but the leading interest continues to quote \$31, base, Chicago, on open hearth forging billets.



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**Rails and Track Supplies.**—Including its allotment of the New York Central rail order, the Illinois Steel Company booked about 100,000 tons of standard rails last week. This includes 10,000 tons from the Chicago, Burlington & Quincy, which also ordered 10,000 tons from the Lackawanna Steel Company and 10,000 tons from the Colorado Fuel & Iron Company. Good orders were taken for light rails, including several sales for export to South American countries. The railroads are not placing large yearly contracts for track supplies, but their current orders and specifications are improving. We quote standard railroad spikes at 1.65c. to 1.75c., base; track bolts with square nuts, 2.15c. to 2.25c., base, all in carload lots, Chicago. Light rails, 40 to 45 lb., 1.16c. to 1.20½c.; 30 to 35 lb., 1.19½c. to 1.24c.; 16, 20 and 25 lb., 1.20½c. to 1.25c.; 12-lb. 1.25c. to 1.29½c., Chicago.

**Structural Material.**—The American Bridge Company has received specifications for 13,000 tons of steel construction for the Minnesota Steel Company, and it is understood that work on this plant is to be rushed. The Heyworth building, Chicago, a theatre and office building, 2250 tons, standard shapes, was let to the Brown-Ketcham Iron Works, Indianapolis. The City Club, Chicago, 200 tons, went to the Vierling Steel Works. Buildings for the Pabst Brewing Company, Milwaukee, 2000 tons, were let to the Worden-Allen Company. The Chicago & Northwestern Railroad has awarded 1500 tons of bridge work to the King Bridge Company, in addition to the contracts given other fabricating interests by this railroad which were reported last week. A highway bridge at Peoria, Ill., 1000 tons, was let to the Milwaukee Bridge Company. Swinging bridges at Dallas, Texas, 230 tons, were let to the Virginia Bridge Company. A high school building at Portland, Ore., 200 tons, was taken by Milliken Brothers, Inc. These contracts, with those reported last week, make a total of about 50,000 tons of structural and bridge business in the West in two weeks. The Illinois Steel Company has booked two or three orders for structural material and plates which amount to 25,000 tons, besides a large number of small orders, and other mills selling in this territory report a great improvement in current business. Plain material is very firm and prices on fabricated work are stiffening. The smaller fabricating shops are filling up with work on highway bridges and small buildings. We quote plain material from mill, 1.58c. to 1.63c., Chicago; from store, 1.80c. to 1.90c., Chicago.

**Plates.**—The Pennsylvania Lines, West, have given the American Car & Foundry Company an order for 500 50-ton steel coal cars. Smaller lots of flat cars and special cars were awarded to other car companies. The report that Missouri Pacific had ordered 2000 steel cars is not confirmed. The St. Louis Southwestern has ordered 2000 wooden cars from the American Car & Foundry Company. Specifications for car material are getting around to the mills and make quite an increase in the tonnage of plates booked. We quote mill prices at 1.58c. to 1.63c., Chicago; store prices, 1.80c. to 1.90c., Chicago.

**Sheets.**—Sheet business is not growing at the rate that appears in heavier products, but there is more new business and conditions are improving as rapidly as the sheet interests expected. We quote Chicago prices, carload lots, from mill: No. 28 black sheets, 2.38c.; No. 28 galvanized, 3.38c.; No. 10 blue annealed, 1.83c. Prices from store, Chicago, are: No. 10, 2.10c. to 2.20c.; No. 12, 2.15c. to 2.25c.; No. 28 black, 2.75c. to 2.85c.; No. 28 galvanized, 3.65c. to 3.75c.

**Bars.**—The market for all grades of bars is quiet. The agricultural implement manufacturers have been giving the mills good specifications on contracts for soft steel bars, but there is not much new business. The hard steel bar mills find the trade very dull. We quote as follows: Soft steel bars, 1.58c.; bar iron, 1.30c. to 1.35c.; hard steel bars rolled from old rails, 1.40c. to 1.45c., all Chicago. From store, soft steel bars, 1.80c. to 1.90c.

**Wire Products.**—The advance in wire prices was made without giving buyers any opportunity to cover, and there is a general expectation in the hardware trade of another advance within a few weeks. This is bringing in a rush of specifications and business is running considerably in excess of the 6000 tons daily average of the wire mills. Jobbers' carload prices, which are quoted to manufacturing buyers, are as follows: Plain wire, No. 9 and coarser, base, 1.73c.; wire nails, 1.93c.; painted barb wire, 1.93c.; galvanized, 2.23c., all Chicago.

**Merchant Steel.**—The mills are generally behind in deliveries on their specifications from the agricultural implement trade.

**Cast Iron Pipe.**—The United States Cast Iron Pipe & Foundry Company booked orders last week amounting to about 5000 tons of gas pipe, and also secured 2000 tons of water pipe at Kansas City, Mo. St. Paul, Minn., let 950 tons of water pipe to the American Cast Iron Pipe & Foundry Company.

On current business we quote, per net ton, Chicago, as follows: Water pipe, 4-in., \$25; 6 to 12 in., \$24; 16-in. and up, \$23.50, with \$1 extra for gas pipe.

**Old Material.**—A favorable indication in the scrap trade is that dealers are beginning to bid higher prices on railroad lists than current quotations for spot material. Railroad scrap purchased from a list usually does not arrive on the dealer's hands for disposition for 30 to 60 days. The bids received by the Chicago, Burlington & Quincy on a list which closed last week were generally 25c. to 50c. better, allowing for switching charges, than the figures at which dealers have been delivering scrap to local buyers. In the market for spot material there is practically no change, except that high grade wrought scrap, like arch bars and transoms, is a little stronger. The prices quoted below are for delivery to buyers' works, all freight and switching charges paid. Sellers of scrap usually receive 50c. to \$1 less in this district, owing to high switching charges. Following prices are per gross ton, delivered Chicago:

Old iron rails.....	\$14.50 to \$15.00
Old steel rails, rerolling.....	13.25 to 13.75
Old steel rails, less than 3 ft.....	12.50 to 13.00
Relaying rails, standard sections, subject to inspection.....	23.00 to 24.00
Old car wheels.....	13.00 to 13.50
Heavy melting steel scrap.....	11.50 to 12.00
Frogs, switches and guards, cut apart.....	11.50 to 12.00
Shoveling steel.....	11.00 to 11.50

The following quotations are per net ton:

Iron angles and splice bars.....	\$13.00 to \$13.50
Iron arch bars and transoms.....	14.50 to 15.00
Steel angle bars.....	11.00 to 11.50
Iron car axles.....	18.50 to 19.00
Steel car axles.....	17.50 to 18.00
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	10.50 to 11.00
Steel knuckles and couplers.....	11.25 to 11.75
Locomotive tires, smooth.....	17.00 to 17.50
Steel axle turnings.....	7.75 to 8.25
Machine shop turnings.....	6.50 to 7.00
Cast and mixed borings.....	5.00 to 5.50
No. 1 busheling.....	9.25 to 9.75
No. 2 busheling.....	7.25 to 7.75
No. 1 boilers, cut to sheets and rings.....	8.00 to 8.50
Boiler punchings.....	13.00 to 13.50
No. 1 cast scrap.....	11.75 to 12.25
Stove plate and light cast scrap.....	10.25 to 10.75
Railroad malleable.....	10.75 to 11.25
Agricultural malleable.....	10.00 to 10.50
Pipes and flues.....	8.50 to 9.00

M. M. Broad withdrew from partnership with the American Iron & Supply Company, taking effect February 1, and has taken active charge of the Chicago Scrap Iron Company, First National Bank Building, as president and treasurer, and will carry on a regular brokerage business in scrap iron and steel, with an increase in the capital stock of that company from \$5000 to \$20,000.

## Philadelphia

PHILADELPHIA, PA., January 31, 1911.

The market appears to gain strength sentimentally, backed to some extent by slightly better buying. The volume of general business for the month shows an improvement over that for December. There is a greater disposition shown by consumers of pig iron to buy ahead, but sellers are not disposed to accept that class of business at current prices, some preferring to blow out their furnaces. The only stack of the Wharton Steel Company now active will be blown out this week, and the Warwick Iron & Steel Company has definitely decided to blow out its No. 2 furnace about the middle of February. Several eastern Pennsylvania producers are also considering a reduction in output. The Delaware River Steel Company will blow in its furnace on basic iron about February 15, and later in the month the Princess Furnace Company expects to blow in its stack at Glen Wilton, Va. Sellers of finished material report more activity. Plates, shapes and billets have been purchased in somewhat better quantities and prices are well maintained. Refined iron bars are easier, sales being reported at 1.30c., delivered here. The feature of the old material market has been sales of old car wheels for export.

**Iron Ore.**—Sales of 100,000 tons of Wabana ore, for this year's delivery, have been made to consumers in this district at 7½c. per unit. This is ½c. above the last sales made for 1910 delivery, the higher price being due to the export duty of 7½c. a ton, effective this year, and the heavy demand for shipments abroad. Negotiations are pending for further sales, and it is expected that another 100,000 tons will be distributed among consumers in this territory. A little more interest is being shown in other brands of ore, but no sales are reported. Importations at this port for the week ending January 28 show a total of 5515 tons, valued at \$10,644.

**Pig Iron.**—While there has been no pronounced buying, sellers feel encouraged by the increased inquiry for for-

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ward deliveries. In some instances melters of foundry iron would place orders for second and third quarter delivery and even for the remainder of the year, but sellers show little interest in such business at current prices and are inclined to contract only for deliveries running over the next three or four months. In low grade iron, one sale of 5000 tons and another of 1000 tons, the latter at \$14.75, delivered, to cast iron pipe makers in this district have been reported, with further business still under negotiation. Of local iron fair sales of No. 2 X and No. 2 plain foundry grades are being made, few exceeding 300 tons. More activity is reported in Virginia foundry; sales running up to lots of 500 tons, delivery during the next three and four months, have been made to customers in this territory, with somewhat larger blocks for Western shipment. Leading Virginia producers maintain the \$13, furnace, basis, for either No. 2 X or No. 2 plain grades, although it is said that a concession of 25c. is still to be had, in one or two instances, for less desirable makes. No transactions in Southern iron are reported in this district. Forge iron shows a little movement, small sales being reported at \$14.25, delivered here. Buyers are still in the market and are endeavoring to shade this price. No further movement in steel making grades is reported. The recent purchase of 3000 tons of low phosphorus iron by a mill in this city was about equally divided between two makers. Prices for this grade have been gradually declining recently and the market for standard analysis low phosphorus iron now ranges from \$21.50 to \$21.75, delivered in this vicinity. One consumer of basic would take a block of that grade for delivery during the next 60 days at \$14.25, but, while business was recently done at that level, sellers are holding out for \$14.50 for prompt deliveries, and are disinclined to quote on extended shipments. The general range of prices is being well maintained, and sellers contend that no further concessions will be available for the usual standard brands of iron, quotations for which, delivered in buyers' yards in this territory during the next three or four months range about as follows:

Eastern Pennsylvania, No. 2 X foundry	\$15.50 to \$15.75
Eastern Pennsylvania, No. 2 plain	15.00 to 15.25
Virginia, No. 2 X foundry	15.80 to 16.00
Virginia, No. 2 plain	15.80 to 16.00
Gray forge	14.25
Basic	14.25 to 14.50
Standard low phosphorus	21.50 to 21.75

**Ferromanganese.**—Arrivals of moderate quantities of unsold ferro continue to exert a weakening influence on prices and \$38, Baltimore, is by no means strong for moderate lots for prompt shipment. For delivery over the second quarter \$38.25 and for the second half \$38.50, Baltimore, about represents the market for 80 per cent. Business in this territory, however, is practically at a standstill.

**Billets.**—Makers feel more encouraged with the outlook. Specifications against contracts, both in rolling and forging billets, have been more substantial and a moderate amount of new business comes out; individual orders, however, continue small in size, but have been more numerous, and the aggregate business is somewhat better. While consumers still endeavor to get price concessions, Eastern makers are maintaining firmly the present basis of prices, open hearth rolling billets being quoted at \$25.40, and ordinary forging billets \$30.40, delivered in this vicinity.

**Plates.**—A moderate amount of new business has come out, while specifications against contracts have been more liberal, as a result of which the makers view the situation more hopefully. Inquiries have also been more plentiful; one for about 1000 tons of boat steel is before the trade, while a very fair number of moderate specifications for boiler, tank and bridge plates are being figured on. Some car business is also under negotiation. Mills close the month with a better volume of business on hand, and while some few moderate contracts for deliveries over varying portions of the first half of the year have been taken, mills are not very anxious for that class of business. Prices are being firmly maintained, 1.55c., delivered in this territory, representing the minimum for ordinary heavy plates.

**Structural Material.**—The contract for the Vine street pier, on which bids were opened January 20, is still unplaced, as are also several smaller propositions on which the quantities required are around 200 to 300 tons. A better run of small orders for work of a miscellaneous character is reported, and the trade looks forward to more active buying during the current month, although the major portion of the work in sight is either small or of moderate size. Prices are well maintained at 1.55c. minimum for plain shapes, delivered in this territory.

**Sheets.**—Most makers in this district continue to operate their mills close to full capacity, but in few instances have sufficient orders ahead to insure over a week's run. A fair amount of business comes in from day to day, however, and the outlook is considered somewhat more favorable, although little disposition is shown by consumers to contract for ex-

tended requirements: Prices are firm and unchanged, Eastern mills naming the following range for early deliveries: Nos. 18 to 20, 2.50c.; Nos. 22 to 24, 2.60c.; Nos. 25 and 26, 2.70c.; No. 27, 2.80c.; No. 28, 2.90c.

**Bars.**—A fair volume of business has been done in refined iron bars, but at the expense of prices. There is considerable competition for desirable specifications. Refined iron bars are to be had at 1.30c. to 1.40c., delivered in this vicinity, although some producers will not meet the lower quotations. A moderate business in steel bars has been done at unchanged prices, 1.55c., delivered here.

**Coke.**—Business is rather quiet. Small sales of foundry coke continue to be made at unchanged prices. Negotiations for furnace coke for forward delivery are less pronounced, consumers generally confining their purchases to prompt lots. The range of quotations shows little change, the following being named, per net ton, for delivery in buyers' yards in this vicinity:

Connellsville furnace coke	\$3.75 to \$3.90
Foundry coke	4.25 to 4.50
Mountain furnace coke	3.35 to 3.50
Foundry coke	3.85 to 4.10

**Old Material.**—The feature of the market has been the export movement in old car wheels. Individual sales have been mostly in lots of a few hundred tons, at prices ranging from \$13.25 to \$13.50 on dock, seaboard. In the aggregate about 2000 tons have been recently moved, shipments being made to Italy, Germany, England and Canada. Rumors are occasionally heard of possible exports of heavy steel scrap, but we can learn of no actual transactions. The domestic demand shows no appreciable change, although the market is sentimentally stronger, and any marked buying would, no doubt, be productive of higher prices. At the present level few holders of the principal grades of old material are willing to sell any quantity, preferring to maintain present accumulations. A small movement in bargain lots of heavy melting steel is reported at prices ranging from \$12.50 to \$13, delivered in this territory. The top price, however, would hardly be productive of any heavy movement of strictly No. 1 steel. There has been little demand for the rolling mill grades of scrap, and prices show practically no change. The following range about represents sellers' ideas of the market for deliveries in buyers' yards, eastern Pennsylvania and nearby points, carrying a freight rate from Philadelphia ranging from 45c. to \$1.35 per gross ton:

No. 1 steel scrap	\$12.50 to \$13.00
Old steel rails, rerolling	15.00 to 15.50
Low phosphorus	17.50 to 18.00
Old steel axles	19.50 to 20.00*
Old iron axles	26.00 to 27.00*
Old iron rails	17.00 to 17.50
Old car wheels	13.00 to 13.50
No. 1 railroad wrought	15.50 to 16.00
Wrought iron pipe	12.50 to 13.00
No. 1 forge fire	11.00 to 11.50*
No. 2 light iron	7.00 to 7.50*
Wrought turnings	8.25 to 8.75
Cast borings	8.25 to 8.75
Machinery cast	14.00 to 14.50
Railroad malleable	12.25 to 12.75
Grate bars	11.00 to 11.50
Stove plate	10.00 to 10.50

\* Nominal.

J. C. Moyer & Co., iron, steel, coal and coke merchants, have removed their offices from the Pennsylvania Building to 610 Real Estate Trust Building, Philadelphia.

## Cleveland

CLEVELAND, OHIO, January 31, 1911.

**Iron Ore.**—The lowering of the duty on Canadian ore under the proposed reciprocity agreement with Canada is not causing much concern among the lake ore firms, as the imports of Canadian ore from the Lake Superior region are light, and it is not expected that even the entire removal of the present duty of 15 cents a ton would tend to increase these imports to any great extent. No new developments have appeared in the matter of fixing 1911 prices. We quote prices as follows: Old range Bessemer, \$5; Mesaba Bessemer, \$4.75; Old range non-Bessemer, \$4.20; Mesaba non-Bessemer, \$4.

**Pig Iron.**—The local market continues quiet. The only sale of any size reported is a fairly good tonnage of basic by a Cleveland furnace. Some inquiry for small quantities of foundry iron is coming out, and a few sales of lots of 300 tons and under are reported. The majority of buyers, however, are taking no interest in the market. Some will need iron within the next few weeks, but express their intention not to make purchases until their present supply is about exhausted, as they do not look for any advance in prices. Local prices are firm at \$14.25, delivered, Cleveland, for No. 2. There is a little firmer feeling in the Valley. While \$13.75, Valley furnace, can still probably be shaded one or two Valley interests have advanced their price to \$14 for



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No. 2 foundry and the sale of a few small lots is reported at that price. Business has picked up somewhat with the small foundries, but some of the large foundries report a light volume of orders. For prompt shipment and the first half we quote, delivered, Cleveland, as follows:

Bessemer .....	\$15.90
Northern foundry, No. 1.....	14.50
Northern foundry, No. 2.....	14.25
Northern foundry, No. 3.....	14.00
Gray forge.....	14.00
Southern foundry, No. 2.....	15.35
Jackson Co. silvery, 8 per cent. silicon.....	19.00

**Coke.**—The only sales reported are small lots of foundry coke for spot shipment. Prices remain stationary. We quote standard Connellsville furnace coke at \$1.40 to \$1.55 per net ton, at oven, for spot shipment and \$1.70 to \$1.80 for the first half. Connellsville 72-hour foundry coke is held at \$2 to \$2.15 for spot shipment and \$2.25 to \$2.50 for the first half.

**Finished Iron and Steel.**—The better demand noted during the past two or three weeks shows further improvement in all lines and the feeling is now very general that the improvement will be permanent. Specifications are coming out quite freely and there is a good volume of current orders. While the latter are mostly for small lots, they aggregate a good tonnage. A number of contracts for steel bars, plates and structural material have also been placed for the first quarter and first half. Stocks of fabricators have become very low and orders have been placed to replenish these stocks. The demand for plates, which has been slower than other lines to pick up, now shows a fair improvement, some new orders being placed by tank shops. Prices on steel bars, plates and structural material are firm at 1.40c., Pittsburgh. The demand for sheets shows considerable improvement and prices appear to be firmly maintained. The American Shipbuilding Company has placed an order with the Carnegie Steel Company for 3000 to 3500 tons of plates and shapes for two new lake boats, and a boat to be built for the Wisconsin Steel Company will require about the same tonnage. A local mill agency will receive specifications in a few days from an Ohio bridge builder for 2000 tons of plates and shapes for a Western bridge. Among new structural inquiries is one from the Lake Shore Railroad for 1500 tons for grade crossing elimination work in Chicago. Fabricators still complain that work is being taken at very low prices. There is a good demand for forging billets in carload lots to replenish stocks, which have been allowed to run low. A Michigan automobile manufacturer is in the market for 1000 tons of forging bars. The demand for iron bars continues moderate, with prices stationary at 1.30c. to 1.35c., at mill. Jobbers report quite an improvement in warehouse orders. The demand for iron pipe and shafting is quite active.

**Old Material.**—The market shows considerable improvement in small lot orders and prices are firmer. Little of any kind of scrap is being offered at recent prices. Dealers feel that, with the improvement in the steel industry, scrap prices will be established at a higher level and they are holding out for 50c. to \$1 a ton higher than recent quotations on most grades. No inquiries for round lots for future delivery are coming out. The railroad lists this week include usual monthly tonnages from the Wheeling & Lake Erie, to be closed February 1, and from the Pennsylvania Lines West and Erie Railroad, to be closed February 2. Dealers' prices per gross ton, f.o.b. Cleveland, are as follows:

Old steel rails.....	\$14.00 to \$14.50
Old iron rails.....	15.50 to 16.00
Steel car axles.....	19.00 to 19.50
Heavy melting steel.....	12.75 to 13.25
Old car wheels.....	12.50 to 13.00
Relaying rails, 50 lb. and over.....	22.50 to 23.50
Agricultural malleable.....	11.50 to 11.75
Railroad malleable.....	12.75 to 13.00
Light bundled sheet scrap.....	7.50 to 8.00

The following prices are per net ton, f.o.b. Cleveland:

Iron car axles.....	\$21.00 to \$21.50
Cast borings.....	6.50 to 7.00
Iron and steel turnings and drillings.....	6.50 to 7.00
Steel axle turnings.....	8.75 to 9.00
No. 1 bushel in.....	11.00 to 11.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 1 cast.....	12.00 to 12.50
Stove plate.....	10.00 to 10.50
Bundled tin scrap.....	11.00 to 11.50

## Cincinnati

CINCINNATI, OHIO, February 1, 1911.—(By Telegraph.)

**Pig Iron.**—A better market sentiment may be reported, but inquiries are still principally for small lots, and actual business booked will hardly aggregate that of the previous seven days. The situation may be tersely summed up in the statement of a local firm, that we are just one week nearer a change, which present conditions indicate will be for the better. Consumption is now estimated to be about equal with production, and there seems to be no tangible reason

why a gradual stiffening in prices should not commence at an early date. Numerous intimations have been received from prospective customers that if concessions were made in price they would place their orders immediately, but generally speaking furnace interests do not appear willing to meet buyers' views, and any shading in quotations in this market would doubtless cover only a few special lots of iron not up to standard and for spot shipments. A local melter is inquiring for 1500 to 2000 tons of analysis iron, and is expected to close this week. The specifications would indicate that this order will be about equally divided between Southern and Northern iron, with the possibility that a Virginia furnace may take part of the business. For No. 2 foundry our quotations remain at \$11, Birmingham, for Southern, and \$14, Ironton, for Northern for first half shipment. Malleable is not in demand, and is quoted at \$14, Ironton, for either prompt or first quarter shipment. A couple of small inquiries are out for gray forge, but no business has so far resulted. Based on freight rates of \$3.25 from Birmingham and \$1.20 from Ironton, we quote, f.o.b. Cincinnati, as follows, for first quarter:

Southern coke, No. 1 foundry.....	\$14.75
Southern coke, No. 2 foundry.....	14.25
Southern coke, No. 3 foundry.....	13.75
Southern coke, No. 4 foundry.....	13.50
Southern coke, No. 1 soft.....	14.75
Southern coke, No. 2 soft.....	14.25
Southern gray forge.....	13.00
Ohio silvery, 8 per cent. silicon.....	18.20
Lake Superior coke, No. 1.....	15.70
Lake superior coke, No. 2.....	15.20
Lake Superior coke, No. 3.....	14.70
Standard Southern car wheel.....	25.25
Lake Superior car wheel.....	19.50

(By Mail.)

**Coke.**—Inquiries are scarce, and those that have been pending for furnace coke remain unclosed. With the exception of two or three special contracts, practically no large business in furnace coke is looked for before June or July. Foundry coke is moving only in carload quantities, though prices are said to be a trifle firmer. Connellsville furnace coke is still obtainable around \$1.50 per net ton at oven for prompt shipment, but Pocahontas and Wise County coke is held at \$1.65 to \$1.75, with contract figures ranging a few cents higher. Foundry coke, for spot shipment, is bringing an average of \$2 per net ton at oven in all three fields, and between \$2.15 to \$2.25 for first half delivery, although there are a few special brands that are being sold as high as \$2.50 per net ton at oven.

**Finished Material.**—The past week showed up well in the finished material line, and, while this week opens up with a good inquiry for structural material and steel bars, actual business is rather light. This is said to be due to press reports of another steel meeting in New York, and many consumers are holding back awaiting the results of this conference. No cut in prices is anticipated by local mill agencies, but the announcement of the alleged meeting appears to have had a disturbing influence. The mill price on structural material and steel bars is 1.40c., Pittsburgh, and the warehouse quotations range between 1.75c. and 2c.

**Old Material.**—Although prices remain the same, the market generally is quieter. The foundries continue buying only carload lots. One dealer reports a fairly good business in cotton tie clippings, bought in the South and shipped to Western copper mines. Prices for delivery in dealers' yards, southern Ohio and Cincinnati, are as follows:

No. 1 railroad wrought, net ton.....	\$12.00 to \$12.50
Cast borings, net ton.....	4.75 to 5.25
Steel turnings, net ton.....	6.00 to 6.50
No. 1 cast scrap, net ton.....	11.00 to 11.50
Burnt scrap, net ton.....	8.00 to 9.00
Old iron axles, net ton.....	17.50 to 18.50
Bushel sheet scrap, gross ton.....	8.50 to 9.00
Old iron rails, gross ton.....	14.50 to 15.50
Relaying rails, 50 lb. and up, gross ton.....	21.50 to 22.50
Old car wheels, gross ton.....	12.00 to 12.50
Heavy melting steel scrap, gross ton.....	11.25 to 11.75

## Birmingham

BIRMINGHAM, ALA., January 30, 1911.

**Pig Iron.**—Practically all the producers in this district are holding more firmly and accepting orders more nearly only on a prompt shipment basis than was the case January 1. It is a fact that firm offers at \$11 for shipment over the next six months have been refused. It is also known that a firm offer of \$10.75 at furnace for 2000 tons for shipment over the next 60 days was declined. While there have been no very large sales, the continued inquiry for lots of 100 to 5000 tons has tended to confirm pig iron people here in the belief that certainly prices will not go lower, and that they have everything to gain and nothing to lose by making \$11 the minimum and by quoting only for nearby delivery. There is a pronounced shortage of No. 4 foundry and gray forge, as well as a scarcity of the silveries. Several inquiries for high silicon or silvery grades have been before

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the trade the past week. Gray forge is bringing \$10 and No. 4 foundry \$10.25. There is apparently more No. 3 foundry on Alabama furnace yards than anything else. Careful estimate leads to the conclusion that shipments will approximately offset the make for January. All efforts to locate a break in the \$11 price have proved futile, and it is not believed that any open price below \$11 has been made by any interest for any delivery. All interests are refusing to quote for shipment beyond July.

**Cast Iron Pipe.**—Manufacturers continue to report fair tonnages being placed, but insist that prices are such as to yield absolutely no margin of profit. The city of St. Paul is inquiring for 1500 tons of water pipe, while Atlanta is reported as having just bought 1200 tons from a nearby manufacturer. It is understood that Kansas City has recently let contract for 2000 tons, which will be shipped from this district. The plant of the American Cast Iron Pipe Company is in operation; Dimmick and Sheffield are closed down. Prices remain nominally, per net ton, on board cars here, as follows: 4 to 6 in., \$20; 8 to 12 in., \$19.50; over 12 in., average, \$18, with the usual differential of \$1 per ton higher for gas pipe.

**Old Material.**—Scrap dealers report a larger volume of business, but prices no better. In fact, until there is a very much larger buying movement, dealers can hardly expect any improvement in prices. We continue to quote asking prices, per gross ton, f.o.b. cars here, as follows:

Old iron axles.....	\$14.00 to \$14.50
Old iron rails.....	12.00 to 12.50
Old steel axles.....	14.00 to 14.50
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	9.00 to 9.50
No. 1 country.....	7.50 to 8.00
No. 2 country.....	7.00 to 7.50
No. 1 machinery.....	9.50 to 10.00
No. 1 steel.....	10.00 to 10.50
Tram car wheels.....	9.00 to 9.50
Standard car wheels.....	10.00 to 10.50
Light cast and stove plate.....	8.00 to 8.50

### Buffalo

BUFFALO, N. Y., January 31, 1911.

**Pig Iron.**—There has been considerable increase in the tonnage placed as compared with the previous week, some of the business taken having been secured at the expense of the previous week's price schedules, owing to strong competition. An order for 3000 tons of pipe iron was placed by the leading cast iron pipe interest at the minimum of the present schedule. A good total of varied foundry grades and a fair tonnage of both malleable and basic were also bought. Inquiry has shown a broadening interest from a wider field of consumption, covering pipe, agricultural implement, stove, electric and general machinery and general foundry work, indicating that stocks are becoming lower, not from an increased rate of consumption, but owing to the fact that old stocks have been used up during the recent period of slackened replenishment, and consumers are obliged to place orders for current and near-by requirements. Prices appear to have settled, temporarily, at least, into the following approximate schedule for current and first half deliveries, f.o.b. Buffalo, with some furnaces passing all inquiries for last half delivery and declining to quote at present:

No. 1 X.....	\$14.25 to \$14.75
No. 2 X.....	13.75 to 14.25
No. 2 plain.....	13.50 to 14.00
No. 3 foundry.....	13.50 to 13.75
Gray forge.....	13.50 to 13.75
Malleable.....	14.00 to 14.50
Basic.....	14.50 to 15.00
Charcoal.....	17.25 to 17.75

**Finished Iron and Steel.**—The tendency toward increased strength and activity noted last week is being maintained and the feeling of confidence in the development in an improved situation is growing. Inquiry in all lines is good and orders and specifications on contracts are coming in in satisfactory volume. Special activity is shown in tin plate, users feeling that if the present high prices for pig tin continue, with the betterment in the steel market, sheet bars will probably be advanced, causing an advance in the price of tin plate. At any rate, they are apparently convinced there will be no lowering of prices and are coming into the market for their first half requirements. Some improvement is also noted in specifications for cold rolled steel. In the Canadian export trade a considerable tonnage of steel billets has been closed during the week by the Buffalo agency of the leading interest and negotiations are pending on a further quantity, while there is continued good demand in all lines of finished products. Buffalo iron and steel interests that make a specialty of Canadian export business are of the opinion that the reciprocity compact with Canada would be of benefit and at least indirectly increase the export trade in many lines of finished products. In structural material the indications are that a large amount of construction work will be undertaken in this locality the coming

spring and summer. No local work has come out for figures during the week, but a number of inquiries for railroad bridge work in the State are in the market, also some bridge work on the western division of the Lake Shore Railroad. Plans are soon to be out for a 16-story office building for the Canadian Pacific at Toronto, requiring a large tonnage of steel.

**Old Material.**—The free movement of scrap material on contracts is continued, the open weather conditions prevailing in this district giving dealers a favorable opportunity to clean up their yards for the anticipated early spring trade. Some small lot new business has been taken, attributable to these conditions. We quote as follows, per gross ton, f.o.b. Buffalo:

Heavy melting steel.....	\$12.25 to \$12.50
Low phosphorus steel.....	17.25 to 17.50
No. 1 railroad wrought.....	14.75 to 15.25
No. 1 railroad and machinery cast scrap.....	14.00 to 14.50
Old steel axles.....	18.50 to 19.00
Old iron axles.....	23.00 to 23.50
Old car wheels.....	14.00 to 14.50
Railroad malleable.....	13.00 to 13.25
Boiler plate.....	10.25 to 10.50
Locomotive grate bars.....	10.50 to 11.00
Pipe.....	9.75 to 10.00
Wrought iron and soft steel turnings.....	7.00 to 7.25
Clean cast borings.....	6.25 to 6.50

### St. Louis

ST. LOUIS, January 30, 1911.

An increase in the volume of general business for the past week over the corresponding week of 1910 is again shown in the bank clearings of this city and Kansas City. New manufacturing plants for St. Louis have been secured each week for some time past, and more are in prospect in the near future. Railroads are increasing their buying of rails and supplies. The demand for pig iron continues moderate and coke is dull.

**Pig Iron.**—The leading pig iron sales agencies, while in receipt of numerous inquiries during the week, state that actual business was of very moderate proportions. In some instances sellers reported that an encouraging feature was noted in several requests to anticipate contract shipment and in other cases to hurry delivery. The inquiry for 2000 tons of malleable Bessemer reported as pending is likely to be closed this week. The representative of a leading Birmingham interest executed contracts for 850 tons to various consumers. An inquiry is out for 1200 tons of Southern analysis iron for shipment over the second and third quarters. While the undertone is somewhat improved, there is no change in the market for Southern foundry, No. 2 being offered at \$11, f.o.b. Birmingham, for shipment over the first half, with from 25 to 50 cents premium asked for second quarter only. No prices are out for third quarter delivery. Northern iron is quoted at \$14 to \$14.50, f.o.b. Ironton, for shipment over the first half.

**Old Material.**—Leading dealers state that buyers and sellers are apart on prices, consumers demanding concessions that dealers do not feel warranted in making, as they look for a better market, or at least a better demand, in the near future. There were no railroad offerings the past week. Prices are nominally unchanged. We quote dealers' prices, per gross ton, f.o.b. St. Louis:

Old iron rails.....	\$12.50 to \$13.00
Old steel rails, rerolling.....	12.00 to 12.50
Old steel rails, less than 3 ft.....	12.00 to 12.50
Relaying rails, standard sections, subject to inspection.....	24.00 to 24.50
Old car wheels.....	12.50 to 13.00
Heavy melting steel scrap.....	11.50 to 12.00
Frogs, switches and guards, cut apart.....	11.50 to 12.00

The following quotations are per net ton:

Iron fish plates.....	\$11.00 to \$11.50
Iron car axles.....	18.50 to 19.00
Steel car axles.....	17.00 to 17.50
No. 1 railroad wrought.....	11.50 to 12.00
No. 2 railroad wrought.....	10.50 to 11.00
Railway springs.....	10.00 to 10.50
Locomotive tires, smooth.....	16.00 to 16.50
No. 1 dealers' forge.....	9.00 to 9.50
Mixed borings.....	4.50 to 5.00
No. 1 busheling.....	10.00 to 10.50
No. 1 boilers, cut to sheets and rings.....	8.00 to 8.50
No. 1 cast scrap.....	11.50 to 12.00
Stove plate and light cast scrap.....	9.00 to 9.50
Railroad malleable.....	8.50 to 9.00
Agricultural malleable.....	8.00 to 8.50
Pipes and flues.....	8.00 to 8.50
Railroad sheet and tank scrap.....	8.00 to 8.50
Railroad grate bars.....	8.00 to 8.50
Machine shop turnings.....	7.00 to 7.50

**Coke.**—The market for coke is quiet and no large inquiries are pending. A merchant seller reports inquiries for around 20 carloads from various consumers, and other merchant sellers mention booking some carload business. Prices are steady on the basis of \$2 to \$2.25 per net ton, at oven, for standard 72-hr. Connellsville foundry, with



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special selected held 25c. per ton higher for shipment through the year.

**Finished Iron and Steel.**—The leading interest reports a better inquiry for standard rails. A contract with the Terminal Railroad for 3000 tons has been closed and one with an outside railroad company for 500 tons. The inquiry for light rails is fairly good. For structural material the inquiry is still confined to special lots from fabricators. An improved demand for bars is noted mainly from implement and wagon manufacturers. There is a fair demand for track material.

The St. Louis Blast Furnace Company's furnace was put in blast on Saturday.

The Laclede Gas Light Company has begun the construction of one of the largest gas-holders in the country, to cost about \$400,000. The contract was awarded to the Riter-Conley Mfg. Company, Pittsburgh. The new holder will be nearly 200 ft. high and 214 ft. in diameter.

The Pioneer Coal & Coke Company, St. Louis, has been incorporated. The capital stock is \$10,000. The incorporators are Alexander Yule, Frederick E. Coe and N. P. Withington.

## San Francisco

SAN FRANCISCO, January 25, 1911.

No general buying movement has materialized, but the volume of business is gradually increasing, and important transactions are pending in several lines. Purchases for stock are for the most part small, though the larger consumers appear to be taking more interest. Manufacturers of implements and some lines of machinery are preparing for an extremely active year. Water and gas companies are likely to be large purchasers, and considerable business is expected in rails and rolling stock.

**Bars.**—The bar market is unsettled, owing to local competitive conditions. Jobbing prices have been reduced, and the customary differential of 0.20c. between steel and iron abolished, with little probability of its being restored. Some of the larger merchants are handling iron bars on a smaller scale than formerly, though some of the coast mills rolling this material are working at about the usual rate. One mill in southern California has resumed operations after being closed for several weeks. The distributive trade in soft steel is rather quiet, as usual at this season, and merchants are buying in a limited way, though manufacturing interests are beginning to make provision for future requirements. Some foreign material is still arriving on old contracts. Reinforcing bars are fairly active. The city of Los Angeles will require a considerable tonnage for aqueduct work, which is scheduled for completion within 18 months. Merchants are quoting bars from store, San Francisco, at 2c. for both iron and steel, though some interests quote as low as 1.90c. for iron. The Western Steel Corporation now has a considerable tonnage of steel in store, and is quoting 1.90c., f.o.b. San Francisco or Seattle, in 500-ton lots. Importers quote foreign steel, in cargo lots, to arrive, at about 1.70c. in the harbor.

**Structural Material.**—While representatives of the leading Eastern fabricators take a hopeful view of the outlook, the situation at the moment is not entirely satisfactory. Few of the local shops are busy, and there is a tendency to make exceptionally low figures on work in prospect. The McClintic-Marshall Construction Company has taken a contract for 840 tons for a foundry at the government dry-dock, Bremerton, Wash., but aside from this nothing of any importance has been let.

**Rails.**—Bookings of standard sections in this territory have been very satisfactory for January, though individual purchases have usually been of only moderate importance. A general movement is expected in the next few months, as inquiries are coming in from all parts of the Coast.

**Merchant Pipe.**—A slight improvement is noted in the distributive movement, the general plumbing supply trade being active through the country, but quiet in San Francisco. Merchants feel somewhat encouraged regarding the outlook, but are not disposed to carry large stocks, as they have no difficulty in getting quick delivery on current orders.

**Cast Iron Pipe.**—Consumers of cast iron pipe all over the Coast are taking advantage of the present easiness of the market to buy for requirements of the near future, and scattered orders have been received aggregating a larger tonnage than usual for this season. Aside from large orders recently placed for the city of Portland and the Portland Gas Company, most current purchases run under 1000 tons. New inquiries are sufficiently numerous to assure an active movement through the spring. The Bay Cities Water Company has placed an emergency order for 600 tons for the Alameda system, and the Pacific Gas & Electric has ordered

1000 tons for various points in the interior; this business, as well as an order for 800 tons of 6 and 8 in. pipe from the town of Vallejo, Cal., being taken by the United States Pipe Company. The Southern California Consolidated Gas Company is in the market for a large tonnage of both large and small pipe, and there are smaller inquiries from Santa Barbara and Monrovia, Cal. The Redondo Water Company plans to lay 2½ miles of large pipe this spring. Bids have just been received on a complete water system for the town of Ontario, Cal. Lewis Lukes, of the Monterey Railway, Light & Power Company, Monterey, N. L., Mexico, has called for bids, to be received March 1, for installing a gas plant and distributing system at that place.

**Pig Iron.**—The market remains very dull, as local melters are operating on a rather small scale, and are buying little for either spot or future delivery. A cargo of 1000 tons of English iron arrived January 21. Prices show no quotable change, \$22 being the figure generally asked by importers for ordinary grades of English and Continental foundry iron. Southern foundry iron is nominally quoted at \$21.50, but the amount used here is negligible.

**Old Material.**—All descriptions are quiet at the moment, though some business of a fairly large nature is pending in rerolling rails and steel melting scrap. Melters are taking little interest in cast scrap, but offerings are not large. Wrought scrap is in fair demand, but no large lots are offered. All lines are firm, values showing very little change. Quotations are as follows: Cast iron scrap, per net ton, \$18; steel melting scrap, per gross ton, \$12.50; wrought scrap, per net ton, \$12 to \$15; rerolling rails, per net ton, \$15.

## New York

NEW YORK, February 1, 1911.

**Pig Iron.**—Transactions and inquiries in New England have been of more interest in the past week than business in the immediate vicinity of New York. One inquiry for 4000 tons of foundry iron for delivery in Massachusetts, after being before the trade for several weeks, has been withdrawn and purchases of several small lots have been made instead. Two other machinery foundries in New England have been in the market, but no large buying has resulted. In a number of cases orders have been received from foundries to hold up pig iron shipments, in view of the slackening in the demand for castings. This feature of the situation has given sellers some concern. Production of pig iron in New Jersey and Eastern Pennsylvania will be somewhat curtailed in February. One New Jersey and one Lehigh Valley furnace, both of good size, are expected to go out this month and another New Jersey furnace is temporarily out of commission, while further curtailment in the Lehigh Valley is under consideration. Some tentative offers on basic iron are reported in Eastern Pennsylvania, and business will result if the furnaces are willing to meet \$14.25 or a shade lower. A sale of 4000 tons of basic iron has been made for New England delivery. We quote for tidewater delivery as follows: Northern No. 1 foundry \$15.50 to \$15.75; No. 2 X, \$15 to \$15.25; No. 2 plain, \$14.50 to \$14.75; Southern No. 1 foundry, \$15.50 to \$15.75; No. 2, \$15 to \$15.25.

**Finished Iron and Steel.**—Evidences of improved conditions are increasing, extending now to bar iron also. While this line has felt an encouraging sentiment, in the past week it has had more tangible encouragement in better orders. The plate trade also shows greater activity, and in common with all other lines will close a better month in January than it has experienced in half a year. While there are not so many definite items to report in structural lines as in the previous week, it is no indication of a falling off, and the prospect of the near future release of many of the long deferred railroad orders will doubtless have a stimulating effect on business generally and tend to bring out more inquiries for building requirements. The latest structural awards include the Kenova, W. Va., bridge for the Norfolk & Western, 12,000 tons, taken by the American Bridge Company; the catenary bridges for the New Haven electrification, 2500 tons, which went to S. W. Bowles instead of the American Bridge Company as reported last week; the Browning loft building on West Thirty-sixth street, New York, 1700 tons, taken by the Hay Foundry & Iron Works; the Lincoln High School, Portland, Ore., 1000 tons, taken by Milliken Brothers, Inc. Bids were received January 30 on the Cruikshank building at Greenwich and Morton streets, this city, which will be eight stories and require 5000 tons. Other work bid upon includes the Gunter building, Chicago, 2000 tons; a cotton mill in Greenville, S. C., and 500 tons for the Lake Shore. The Delaware & Hudson is reported to be in the market for 2000 to 3000 tons for shops at Watervliet, N. Y. The steel for the Woolworth building in this city is withdrawn from im-

## THE IRON AND METAL MARKETS

mediate consideration by the decision to increase its width and height; it will have a front of an entire block on Broadway and is to be about 750 ft. high, or about 50 ft. higher than the Metropolitan building. The remainder of the site cannot be cleared until May 1 and the plans are to be redrawn so that the steel is not likely to come into the market for several months. Prices are firm as follows: Plain structural material, plates and steel bars, 1.56c. to 1.61c., and bar iron, 1.35c. to 1.40c., all New York. Plain material from store, New York, 1.85c. to 1.95c.

**Steel Rails.**—The United States Steel Products Company has just booked 20,000 tons from the National Railways of Mexico, which is in addition to 5000 tons placed in this country by the same road a few weeks ago. The Boston & Maine and the New Haven orders, amounting together to 61,000 tons, have been held up for some time on account of new points in the specifications, but are now about closed. They call for open hearth rails entirely, and these will be supplied by the Pennsylvania Steel, Lackawanna and Bethlehem companies. The Burlington has placed 30,000 tons, and the Rock Island 10,000 tons. The Western Maryland has taken 12,000 tons, besides 9875 tons already reported.

**Ferroalloys.**—Some fair sales of ferromanganese have been made at about \$38.25, Baltimore, for delivery over the first half. Ferrosilicon is in good demand, with dealers here quoting \$55.50, Pittsburgh, for delivery over the first half.

**Cast Iron Pipe.**—A few small public lettings are coming out in New England, but municipalities generally are slow in making their purchases for this year's requirements. Private gas and water companies, however, are buying quite freely and some of them are taking good sized quantities. Alexander Potter, consulting engineer, 116 Liberty street, is building water works for Okiahoma City, Okla., which will require 3000 tons of pipe. Some manufacturers are feeling firmer in their views as the result of booking considerable business, but others are still taking low priced contracts. Revere, Mass., bought 300 tons of water pipe at \$21.45, delivered. Prices are now \$21.50 to \$22 per net ton, tidewater, for carload lots of 6-in.

**Old Material.**—Buying by consumers is confined to small quantities, seldom exceeding 100 tons. No indication is visible of a disposition to anticipate requirements for any length of time. The belief apparently prevails that no advance is to be feared in the market on old material. The supply is large, and such railroad lists as are now coming out are quite heavy. Cast scrap is strong, notwithstanding the low prices prevailing on pig iron. The volume of business is well distributed through the list. Quotations per gross ton, New York and vicinity, are as follows:

Old girder and T rails for melting.....	\$10.25 to \$10.75
Heavy melting steel scrap.....	10.25 to 10.75
Relaying rails.....	20.50 to 21.50
Standard hammered iron car axles.....	22.00 to 23.00
Old steel car axles.....	16.00 to 16.50
No. 1 railroad wrought.....	12.50 to 13.00
Wrought iron track scrap.....	11.50 to 12.00
No. 1 yard wrought, long.....	11.00 to 11.50
No. 1 yard wrought, short.....	10.50 to 10.75
Light iron.....	5.00 to 5.50
Cast borings.....	6.00 to 6.50
Wrought turnings.....	6.00 to 6.50
Wrought pipe.....	10.50 to 11.00
Old car wheels.....	12.00 to 12.50
No. 1 heavy cast, broken up.....	12.00 to 12.50
Stove plate.....	9.50 to 10.00
Locomotive grate bars.....	8.50 to 9.00
Malleable cast.....	12.00 to 12.50

### Metal Market

NEW YORK, February 1, 1911.

#### THE WEEK'S PRICES

Cents Per Pound for Early Delivery.

Copper, New York.		Lead.		Spelter.	
Jan.	Lake.	Electro-lytic.	Tin.	New York.	St. Louis.
26.....	12.75	12.37½	42.85	4.50	4.32
27.....	12.75	12.37½	43.75	4.50	4.32
28.....	12.75	12.37½	44.35	4.50	4.32
30.....	12.75	12.37½	44.35	4.50	4.32
31.....	12.75	12.37½	43.25	4.50	4.32
Feb. 1.....	12.75	12.37½	42.75	4.50	4.32

After advancing to 44.35c. on Monday, pig tin has receded sharply. The buying movement in copper has eased for the present and the market is rather weak. Lead is weaker in St. Louis. Spelter is listless.

**Copper.**—Copper is weak. It is apparent that consumers have filled their present wants, as they are taking no interest in quotations. Although the buying of two weeks ago was very heavy sellers were unable to dispose of enough to make an appreciable reduction in their holdings. It has been the custom during the last two years for some of the large selling companies to induce a buying movement by making a sharp reduction, as was done two weeks ago, and then advance the price again after about 10 days' selling. There are no signs, however, of such

action being taken at present, and some of the smaller interests have gone so far as to offer concessions with a view to inducing buyers to place large orders. Consumers, however, show no inclination to accept the offers. As is their usual custom around the first of each month, they are awaiting the appearance of the Copper Producers' statistics. Electrolytic copper is offered in New York at 12.37½c. Lake can be had at 12.75c. and perhaps a shade less. The exports of copper during January were good, amounting to 29,257 tons. At the close of trading in London to-day spot copper was sold for £55 3s. 9d., and futures for £55 18s. 9d. The sales amounted to 450 tons of spot and 700 tons of futures. The market closed firm.

**Pig Tin.**—Statistics favorable to the consumer, showing the January deliveries in this country, coupled with the fact that the Banca sale of 2500 tons in Holland on December 26 increased the visible supply of stocks, tended to weaken the hold of the London syndicate. That market declined nearly £7 yesterday and to-day. It is too early, however, to tell whether the operators have decided to let go. The leading consumer of pig tin in this country is reported to have made purchases in New York and in London, but its buying in any event was not heavy. Little trading was done here during the week, although prices steadily advanced until Monday, when they declined in sympathy with the London movement. The low prices made yesterday and to-day did not influence consumers to enter the market. The statistics compiled by C. Mayer, secretary of the New York Metal Exchange, showed deliveries into consumption during January amounting to 3200 tons, as against 3500 tons for the same period of last year. The total visible supply December 31 was 17,194 tons, while yesterday it was 18,616 tons. The average price of pig tin during January was 41.20c. The London market closed with spot tin selling at £194 10s., and futures at £194. The sales amounted to 200 tons of spot and 670 tons of futures. The market closed weak. Pig iron was sold in New York this afternoon for 42.75c.

**Tin Plates.**—Foreign tin plates have advanced again, being quoted this morning at 15s. 1½d., Swansea, Wales. Trade here is picking up, can manufacturers making inquiries for material for delivery over the second half. The price remains unchanged at \$3.84 for 100-lb. coke plates.

**Lead.**—Lead is weaker in St. Louis and sales have been made there at 4.32c. The leading interest continues to quote 4.50c. in New York and other sellers are acting accordingly.

**Spelter.**—Spelter is listless and slightly weaker. Consumers show no interest, but the feeling is that, if they actually wanted to buy, some holders would be willing to make concessions on the usually quoted price, which is 5.55c. New York and 5.40c. St. Louis. The St. Louis market is a great deal more uncertain than the New York trade.

**Antimony.**—Nothing has developed from the attempt made in Europe to form a selling combination among leading producers of antimony, but the talk in that direction resulted in strengthening the market. Resale offerings of Hallett's, which were made at a low price last week, have been taken up and that brand is now quoted at 7.75c. The recent advance in Cookson's to 8.25c. is being firmly maintained, and Chinese brands and Hungarian grades are selling at from 7.25c. to 7.50c.

**Old Metals.**—The market is dull. Dealers' selling prices are nominally as follows:

	Cents.
Copper, heavy cut and crucible.....	12.00 to 12.25
Copper, heavy and wire.....	11.50 to 11.75
Copper, light and bottoms.....	10.75 to 11.00
Brass, heavy.....	8.00 to 8.25
Brass, light.....	6.75 to 7.00
Heavy machine composition.....	10.75 to 11.00
Clean brass turnings.....	7.75 to 8.00
Composition turnings.....	9.00 to 9.25
Lead, heavy.....	4.20 to 4.25
Lead, tea.....	3.95 to 4.00
Zinc scrap.....	4.25 to 4.30

**Metals, Chicago, January 31.**—There has been heavy buying of copper by consumers in this territory, generally for February and March shipment, as a result of the lower prices which became available last week. Spelter and lead are dull. Tin is the despair of the buyer at present. We quote Chicago prices as follows: Casting copper 12½c.; lake, 12¾c., in carloads, for prompt shipment: small lots, ¼c. to ¾c. higher; pig tin, carloads, 45c.; small lots, 47c.; lead, desilverized, 4.45c. to 4.50c., for 50-ton lots; corroding, 4.70c. to 4.75c., for 50-ton lots; in carloads, 2½c. per 100 lb. higher; spelter, 4.40c. to 4.45c.; Cookson's antimony, 10½c., and other grades, 9c. to 10c., in small lots; sheet zinc is \$7.50, f.o.b. La Salle, in carloads of 600-lb. casks. On old metals we quote for less than carload lots: Copper wire, crucible shapes, 12½c.; copper bottoms, 10c.; copper clips, 12c.; red brass, 10½c.; yellow brass, 9c.; lead pipe, 4¾c.; zinc, 4¼c.; pewter No. 1, 29c.; tin foil, 34c.; block tin pipe, 37c.



# THE IRON AND METAL MARKETS

**Metals, St. Louis, January 30.**—Lead is quiet at 4.32½c. to 4.35c.; spelter is dull at 5.30c., both at East St. Louis. Zinc ore is held at \$41 per ton, Joplin base. Tin is stronger and quoted at 44.10c. per pound; antimony (Cookson's) unchanged at 8.60c.; lake copper easier at 13.05c.; electrolytic, 12.85c. all at St. Louis. The demand for finished metals was active for the first half and quiet for the last half of the past week.

## Notes on Prices

**Rope.**—Jute fiber is about the only line for which there is a fair inquiry, and it is advancing in price. Sisal fiber is somewhat weak, owing to lack of demand, while on other than the highest grades of Manila hemp lower prices are expected by cordage manufacturers. The following quotations represent prices to the retail trade in the Eastern market for rope 7-16 in. in diameter and larger, with, card advances for smaller sizes: Pure Manila of the highest grade, 8¼c. to 9¼c. per pound; second grade Manila, 7¼c. to 8¼c. per pound; hardware grade, 7¼c. to 7¾c. per pound; pure sisal of the highest grade, 6¼c. per pound; second grade, 6¼c. per pound; rove jute rope, ¼-in. and up, No. 1, 6½c. to 7c. per pound; No. 2, 6c. to 6½c. per pound.

**Linseed Oil.**—The strong position that has characterized the linseed oil market is not so pronounced, business having fallen off, but without change in quotations. The high prices bid for flax seed at Northwestern points last week brought considerable seed to market. Shipments of seed and oil arrived from Argentine last week in considerable volume, largely for paint manufacturers. The local demand for oil is comparatively light. The following quotations represent New York prices in five-barrel lots or more:

	Cents.
State, raw.....	94
City, raw.....	94
Linseed, in lots less than 5 bbl., 1 cent advance per gallon.	
Boiled oil, 1 cent advance per gallon.	

**Naval Stores.**—Turpentine holds a high level in prices, and while buying continues in Savannah the demand is light in the New York market. High prices have resulted in the use of large quantities of turpentine substitutes and paint manufacturers are using other products which they would not have thought of a year or so ago. This is affecting the demand for turpentine to a considerable extent. New York quotations in five-barrel lots are as follows:

	Cents.
In oil barrels.....	86
In machine barrels.....	86½
Less than 5-bbl. lots, ½ cent advance per gallon.	

Rosin prices are firm in sympathy with the Savannah market and buying is of a hand-to-mouth character. On the basis of 280 lb. to the barrel, common to good strained is quoted at \$6.75 and grade D at \$7.05 in the New York market.

## The Frick Coke Company Will Not Reduce Wages.

—Reports have been current for some time that the Frick Coke Company and other operators in the Connells-ville region were contemplating an early reduction in coke workers' wages on account of the very low prices of blast furnace and foundry coke. These reports were brought to the attention of Thomas Lynch, president of the H. C. Frick Coke Company, who denied their truth in a statement as follows: "The scale of wages put into effect by our coke companies January, 1910, is still being strictly adhered to. There has been no reduction in any item at any of our plants, and no reduction is contemplated. On the contrary, we hope and believe that if any change is made in wages during 1911 it will be an advance and not a reduction."

The plant of the Star Expansion Bolt Company at Bayonne, N. J., was almost entirely destroyed by fire January 20. The loss on buildings and machinery was almost complete. The stock of manufactured merchandise, however, was but slightly damaged, and the company was enabled to continue deliveries without interruption. The general and executive offices of the company are at 147-149 Cedar street, New York, with branch offices and warehouses in Chicago, San Francisco, New Orleans, Montreal, Toronto and Winnipeg. The company carries heavy stocks at all of its branch warehouses.

**Rubber Goods.**—Owing to the further decline in raw rubber there has been some lowering of prices in belting, hose, rubber specialties and other mechanical rubber goods, approximating 5 to 10 per cent. This decline applies to the higher grades of goods only, as in the cheaper lines there is naturally much less rubber, the prices of which are not materially changed.

**Vitrified Sewer Pipe.**—The general quotation on first-class vitrified standard sewer pipe and fittings, 3 to 24 in., in carload lots, f.o.b. factory, is 88 per cent. discount. The demand is comparatively light and the market is not very strong, owing to competition and a desire to move stocks.

## Iron and Industrial Stocks

NEW YORK, February 1, 1911.

Another period of advancing prices has occurred. Nearly all the steel and equipment stocks made important gains. The range of prices on active iron and industrial stocks from Wednesday of last week to Tuesday of this week was as follows:

Allis-Chalm., com..	8 - 8½	Railway Spr., pref.	96 - 98½
Allis-Chalm., pref..	29½ - 33½	Republic, com.....	32½ - 34½
Beth. Steel, com....	29½ - 33½	Republic, pref.....	94 - 98½
Beth. Steel, pref..	59½ - 62½	Sloss, com.....	50 - 51
Can, com.....	9½ - 10½	Pipe, pref.....	51 - 56
Can, pref.....	79½ - 82½	U. S. Steel, com.....	77½ - 80
Car & Fdry, com....	53½ - 55½	U. S. Steel, pref.....	118½ - 120
Car & Fdry, pref..	116 - 117	Westinghouse Elec.	66½ - 68
Steel Foundries....	45½ - 46½	Va. I. C. & C.....	58 - 59½
Colorado Fuel.....	34½ - 35½	Am. Ship, com.....	75
General Electric....	151 - 154	Am. Ship, pref.....	111½
Gr. N. ore cert....	59 - 60½	Chl. Pacn. Tool....	43 - 46½
Int. Harv., com....	113½ - 116½	Cambria Steel....	44½ - 45½
Int. Harv., pref..	123	Lake Sup. Corp....	28 - 29
Int. Pump, com....	39½ - 40½	Pa. Steel, pref.....	106
Int. Pump, pref..	84½ - 85½	Warwick.....	10 - 10½
Locomotive, com....	40 - 41½	Crucible St., com....	12½ - 12½
Locomotive, pref..	110½	Crucible St., pref..	75½ - 79½
Pressed St., com....	32½ - 34½	Harb.-W. Ref., com....	35
Pressed St., pref..	96 - 97	Harb.-W. Ref., pref..	95
Railway Spr., com....	34		

A special meeting of stockholders of the Pittsburgh Valve, Foundry & Construction Company will be held February 23, to vote on a proposed issue of preferred stock to be exchanged for common stock share for share, not exceeding 5750 shares.

At the annual meeting of stockholders of the Keystone Driller Company, Beaver Falls, Pa., held last week, an annual dividend of 6 per cent. was declared.

**Dividends.**—The Pressed Steel Car Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred, payable February 23.

The United States Steel Corporation has declared the regular quarterly dividends of 1¼ per cent. on the preferred stock, payable February 27, and 1¼ per cent. on the common stock, payable March 30.

The Pittsburgh Steel Company has declared the regular quarterly dividend of 1¼ per cent. on the preferred stock, payable March 1.

from which points it can make immediate deliveries in case of emergency or when customers require quick shipment.

The Lawrence Iron & Steel Foundry Company, Thirty-second street and Allegheny Valley Railway, Pittsburgh, of which William Yagle is general manager, is operating its plant to fair capacity on contracts for acid open hearth steel castings for mills and various other uses. The company makes a specialty of building the Blake improved ore and rock crusher, and has lately commenced to make all its principal parts of steel castings, which, being lighter and stronger than iron, make the weight of the assembled machine considerably less and, therefore, enable it to be more easily handled.

The Seneca Chain Company, Kent, Ohio, announces the opening of its Eastern sales office at 30 Church street, New York, in charge of W. A. Hengstenberg, vice-president. The company has two large plants at Kent and Mansfield, Ohio, completely fitted with the most modern equipment for the manufacture and testing of all types and patterns of both hand-made and machine-made welded chains and forgings.

The Cambria Steel Company, Johnstown, Pa., will start its new wire rod mill about February 15, and its wire drawing mills about April 1.

## Pittsburgh's Position in Steel

### Some Considerations Bearing on Its Future

In an interesting address before a meeting of the Pittsburgh Realty Club at Pittsburgh, January 25, Henry P. Bope, vice-president and general manager of sales of the Carnegie Steel Company, discussed the position of Pittsburgh in the manufacture and distribution of steel products, as affected by developments in other districts. Mr. Bope said in part:

#### Other Districts Supply Their Own Demand

We have the supply here, never better than to-day; the genius of our workmen, and their skill and their ability to produce a most satisfactory quality in the most satisfactory way were never greater than to-day; but by the location of large plants in other centers, by the fact that a great demand has arisen in localities where it did not exist before—localities which can be served better by plants located near to the source of demand—our demand has fallen off. I can make that a little plainer by stating, using Chicago as an illustration, that the plants in Chicago, in the neutral freight zone, of course, can do as well as ourselves; but our neutral freight zone only goes to the western Ohio lines. Everything west of that is in the domain of Chicago and Birmingham. Therefore, it becomes necessary for us to look in other directions: first, to find new fields; second, to find new uses for steel. The first is possible; also the second, but not to the same extent, because in the various new uses found for steel other manufacturing concerns can join as well as ourselves.

No one will deny that we have been absolutely extravagant to the point of gross extravagance in the use of natural gas, and what we wasted in the early days of the discovery of that great adjunct to the prosperity of this community would have run it a quarter of a century. We have been equally extravagant in the use of our coal supply. Many times we have not obtained even a new dollar for an old one for our coal, and every ton taken out of the ground under those conditions is absolutely wasted, because it is one of the great laws of nature that she never restores absolute waste. Therefore, it becomes necessary that every bushel of coal, every stick of timber, every ton of ore that is used to-day must carry with its full value; otherwise we are losing the benefit of these resources and conservation is an idle word.

#### Looking to the Future

But we are more interested in knowing what is going to happen to Pittsburgh. I do not know that I am a prophet, but I think the pessimism which is pervading Pittsburgh to-day with regard to its future is unwarranted. We must not be satisfied with the victories of the past. The great problems of the future are twofold. They are undoubtedly operating to obtain the greatest economy in manufacture and selling, because it does no good to produce cheaply if we cannot market the products which are produced. I think we can produce in Pittsburgh as cheaply as we ever could, as cheaply as can be done in any locality in the United States. The commercial problems, however, are a little more serious, for the reason, as I have said, that the territory in which Pittsburgh can operate is becoming more and more restricted, and that some territory contains, in the steel business at least, a larger measure of competition than is found anywhere else in this country. In the district between the western Ohio line and the Atlantic Ocean there is every large plant but one, for I am not considering Birmingham as a very large factor at the present time. It is coming on, but the South with its great resources, with the wealth which is pouring into it from the products of its soil, will become largely a self-contained section of the country, and much larger than any plants there at present or projected south of Mason and Dixon's line can take care of. But here in Pittsburgh we have the competition of every large plant outside of Chicago, and that competition is becoming serious, be-

cause the handwriting is on the wall for the plants located east of the Allegheny Mountains. With Chicago made a basing point as to freight it will be absolutely impossible for any plant east of the Alleghenies to place its product in the Chicago district or west, and it is going to be difficult for Pittsburgh, handicapped as it will be, unless there is some concession from the freight rate of \$3.60 per ton.

#### Pittsburgh's Importance in the Steel Corporation

There are two ways, it seems to me, in which we are going to be able to overcome some of our disadvantages. The first is the canalization of the Ohio River; the second, the opening of the Panama Canal. I would like to preface that statement by saying that I have heard the statement made by business men of Pittsburgh that the formation of the United States Steel Corporation was a detriment to Pittsburgh; but I do not think that is true. The great plants of that organization located in Pittsburgh are not plants that the Corporation by any means despises. When you consider that one of them in this district has a larger total ingot production than all the rest of the Corporation put together, and that its finished product amounts to something more than one-third of the total production of the Corporation, it is not likely that the men who dictate the affairs of that organization are going to take any drastic steps to interfere with the management, the organization or the results to be obtained in this district by their plants located here. I think it is only fair to say also, with due respect to the men who have preceded him, that the new president of the Steel Corporation is a man of wide intelligence, of broad knowledge in commercial matters especially, and a man who is deeply interested in the welfare and prosperity of Pittsburgh, and who is just as anxious to see that prosperity retained and promoted as any of us who are here laboring for the welfare of this great community.

#### River Transportation

Now the question of cheaper transportation rates down the Ohio River is not detrimental to the interests of the railroads. If we follow it up in another way, the products which go down the river will naturally be the heavier products of steel, coal and products of a similar nature. The majority of these products are not in themselves large revenue producers to the railroads in respect to their classification. The railroads would much prefer to see a wider diversity of interests here in Pittsburgh by which a higher character of manufacture would give them a higher class of transportation, and enable them to obtain a larger revenue by reason of that classification. And with the increase of the higher class industries here I am satisfied that the railroads will not only not oppose but will welcome a larger measure of water transportation to the community here. We have recognized this in the building of a fleet of steel barges, the first of which can be seen to-day at the foot of Market street, and which is the beginning of a large fleet of handsome and effective steel barges which will carry our products down the river to the Gulf, and eventually, whether by barge or transshipment, through the Panama Canal to points on the Pacific Coast and westward. Now if we can diversify our interests so as to increase the prosperity of this community, increase the tonnage which is produced here, and give the railroads a larger share of higher rate producing products, naturally they will be only too glad to see a larger portion of the heavier and less valuable freight go away from them. This is one of the means we are going to maintain the supremacy and prosperity of Pittsburgh.

#### Loss of Pacific Coast Steel Trade

Another means will be a larger extension of our foreign trade and regaining that portion of our trade on the Pacific Coast which has been lost to us by reason of the Payne-Aldrich tariff bill. I know the tariff bill is rather a live wire in a Pittsburgh audience, and it ought to be, because when we consider that on the Pacific Coast during the year 1910 there was imported a larger tonnage of steel products than in the four previous years put together, the operation of the Payne-Aldrich tariff bill so



far as it relates to this field has been detrimental, and I do not understand how any man could advocate a reduction in duty, which not only does not reduce the cost of living, but which, by taking work away from the Pittsburgh workman, prevents him from obtaining that which might be cheaper. If that argument be true, then it does not stand to reason that this community is benefited by a tariff bill of that character.

But we have been thinking out the proposition how to get back some of that trade by cheaper transportation from the Atlantic Coast to the Pacific. Whether that is done by contract with existing steamship lines, or whether the large corporations will build their own steamers, whereby they can manipulate their own freight rates from one coast to the other, or whether the transcontinental lines will see the handwriting on the wall and lower their rates is immaterial at this time. So long as one or the other is done, and we can obtain rates of freight that will enable us to deliver our products on the Pacific Coast, it does not make a great deal of difference which it is. This will take up some of the slack we lose elsewhere and it will be another means by which Pittsburgh can retain its supremacy.

#### Heavier Rails and New Uses for Steel

Then we come to the new uses of steel, in which this community will share; but it will not be altogether benefited by this because that is something of which other communities will also get their portion. But it is only fair to assume that with the increased demands upon the railroads for heavier cars, larger loads, larger trains and increased speed, the present system of tracks will not be sufficient for the purpose. Therefore, we can expect a heavier rail, perhaps as much as 33 1-3 per cent. heavier than the largest rail used to-day, which is, and only in the main tracks, 100 lb per yard. That would mean an increase of one-third in the rail tonnage. This would of necessity compel the railroads to look for a better system of track maintenance, and points to the steel tie, which, when it comes, means a very large increase in the demand for steel. There are other things which are being cultivated by the steel manufacturers in this district, so that so far as we are losing tonnage in one direction it is being made up by the several things of which I have spoken.

It seems to me, therefore, that it is not a time for pessimism. It is a time for every one of us to realize that while Pittsburgh has been great in the past and is great to-day, that greatness cannot be retained by being satisfied to rest upon past laurels, but that every one must stand for Pittsburgh in the future as he never stood for her in the past. It means that in lines of operation and commercialism, from the shovel load of the laborer to the inventive genius of the superintendent or the wide commercial knowledge of the commercial man, nothing that efficiency can do in manufacture, in operation can be lost sight of, and we must use every means within our power, legitimate and honest, to promote the interests of this great community.

**The American Blower Company.**—The way in which the American Blower Company, Detroit, Mich., regards the business outlook for 1911 is shown in a personal letter written during the past few days by President Inglis of that company to one of its customers, an extract from which is as follows: "Never in the history of the business of this company at this time of the year have the conditions been more favorable. This statement is based on a survey of current shipments, unfilled orders, prospective business and collections." This company is now working on a large installation for the heating and ventilating plant for the jobbing mill warehouse, sheet mill warehouse and galvanizing departments of the new plant of the American Sheet & Tin Plate Company at Garry, Ind. The contract includes one 240-in. fan and two 220-in. fans, three-quarter housed, 30 sections of heater and a complete system of galvanized iron distributing ducts.

The Follansbee Brothers Company, Pittsburgh, has completed two new sheet mills at Follansbee, W. Va., making a total of four sheet and six tin mills in that plant.

## Byllesby Convention in Chicago

The following interesting article relative to a large engineering company controlling numerous public utility corporations is taken from the *Electrical World*.

The second annual convention of the employees of H. M. Byllesby & Co., and affiliated public service companies, was held in the Congress Hotel, Chicago, January 12-20. The registered attendance was 286, 128 of this number being from the home office in Chicago and 158 from the various affiliated companies scattered throughout the country, these latter operating electric service, street railway, gas power transmission and telephone utilities.

The meeting was opened by an address by H. M. Byllesby, president of the parent company, who in the course of his speech gave some interesting statistics showing the magnitude and extent of the work carried on under the direction of the company of which he is the head. A year ago the company was operating in 40 different municipalities, while at present its activities embrace 82 different municipalities in this country, which are spread broadly from the Canadian border on the north to the Gulf of Mexico on the south and from Illinois to the Pacific Ocean on the west. The employees directly on the pay rolls of H. M. Byllesby & Co. are 138, and those permanently and directly in the field in the various local companies aggregate 2400, making a total of 2538 regular employees. In addition, during the last 12 months an average of 2000 men have been at work in the field on construction, making a grand total of 4538 individuals employed and corresponding to about 23,000 individuals whose livelihood depended upon the interests represented at the meeting.

Mr. Byllesby called attention to the action of a prominent Public Service Commission in one of the States in which the company operates largely, which has prepared a bill to submit to its State legislature whereby public service corporations are authorized, after having capitalized at market value in stocks and bonds for the actual cash cost of their properties, to add thereto 100 per cent. of "profit sharing stock," thus recognizing the value of encouraging industry and enterprise. Mr. Byllesby considers that this is one of the most remarkable steps in advance that have taken place in the public service business in the 30 years during which he has been connected with it. F. H. Tidnan, manager of the Oklahoma Gas & Electric Company and chairman of the convention, responded in appropriate terms to Mr. Byllesby's address.

On Wednesday afternoon, January 18, Samuel Insull, president of the Commonwealth Edison Company, gave an address on modern methods of conducting central station business, and later in the same day Mr. Byllesby gave some interesting reminiscences of the days of electric lighting in the early eighties, when the speaker was a member of the staff of T. A. Edison.

On the recommendation of a committee, of which Harold Almert of Chicago is chairman, it was decided to start a monthly technical and commercial paper to serve as a medium of communication between the various companies and interests affiliated with H. M. Byllesby & Co. It was also decided to collect information on industrial power for a data book to be furnished to all representatives of the companies interested in the various States, which will show the characteristics of various industrial plants using electric drive supplied with electrical energy by the various affiliated companies. The book will contain information about load factors, connected load, power required to drive various types of machinery, &c.

On Tuesday afternoon, Mr. and Mrs. Byllesby gave a reception at the Drexel Boulevard home to the delegates of the convention. Opportunity was also offered to visit the Chicago Electrical Show. Thursday evening there was a theater party. There were also excursions to the Fisk street power house and Division street gas works. On Friday evening a banquet was given at the Congress Hotel.

The officers of H. M. Byllesby & Co. are as follows:

President, H. M. Byllesby; vice-president, in charge of operation, A. S. Huey; vice-president and chief engineer, O. E. Osthoff; vice-presidents, J. S. Cummins of Chicago and C. E. Groesbeck of Portland, Ore., in charge of Pacific Coast interests; treasurer, in charge of auditing, J. J. O'Brien; secretary, R. J. Graf; assistant treasurer, R. E. Wilsey.

## The Depreciation of Unprotected Steel Work

An examination of the steel work of a foundry building was recently made by Lockwood, Greene & Co., Boston, and portions of their report contain matter of much general interest regarding the depreciation of structural steel work.

The structure inspected is of conventional steel mill building design, 500 ft. long and 120 ft. wide, three bays. The south bay contains two 5-ton cranes of 30-ft. span. In the 60-ft. central bay there are four cranes—two 10-ton, one 20-ton and one 30-ton. The 30-ft. north bay is equipped with one 5-ton crane for a portion of its length. The furnaces are located at the west end of the building in the south side bay, which is widened to 40 ft. for a length of about 80 ft. to accommodate them. The following extracts from the report indicate the condition of the steel work 10 years after the erection of the building, the reader being left to draw his own conclusions:

"In inspecting the steel work a most rigid examination was made wherever the eye or hammer showed cause for suspicion; the scale, if any, being chipped off and the remaining metal scraped. No evidence could be found of any damage from gases. The steel columns on the south side are badly rusted near the base, due to constant contact with the earth, 25 per cent. of the total area being lost. This corrosion does not extend more than 1 ft. above the bottom of the column, above which point the metal is in very good condition. In many of these columns the outstanding legs of column angles have been badly bent, in some cases being folded inward about 45 degrees.

"The columns on the north side have suffered somewhat from rust near their bases and from the same cause as on the south side. In addition, their upper portions are rusted sufficiently to reduce the area 10 per cent. None of these columns has angles bent as is the case on the south side. The lower portions of the main columns are in very good condition, as far as rust is concerned. Two places were noted where sufficient rusting has taken place to reduce the area 5 per cent. within 1 ft. of base. Above this point and in the lower portions of all the other main columns the metal is sound and clean. The upper portions of all the main columns opposite the monitor windows are slightly rusted, but not sufficiently so to cause any appreciable reduction in area.

"In the trusses the outstanding leg of the top chord angles has lost about 10 per cent. of its area through rust due to a leaking roof. With this exception the trusses are in first-class condition. One knee brace over charging platform has been cracked. When the large cranes pass the columns there is a perceptible jar. This is doubtless due to the loosening of bolts in the end connections of crane track girders. Examination revealed many loose bolts at these points.

"We were unable to observe any lateral swaying of the building as a whole, more than would be expected in a building of this type. Our representative made a number of trips on the cranes and also stood on various parts of the structure while the regular work of the cranes was being done, and even had the crane operators run their carriages back and forth, starting and stopping as quickly as possible, but no unusual amount of swaying could be observed, and certainly not enough to cause any apprehension. There was no wind blowing at the time our observations were made. Longitudinally the building was exceptionally rigid. We also were unable to note at the time of our visits any appreciable vibration of the whole plant, which has been suggested as sometimes taking place when the engines are running."

## The Pig Iron Record of 1910

The official pig iron figures for 1910, as reproduced on the following page from the *Bulletin* of the American Iron and Steel Association, show a total of 27,298,545 gross tons. Every blast furnace but one reported directly. The increase over 1909 was thus 1,503,074 tons, or 5.8 per cent. The following table gives the half-yearly production in the past four years in gross tons:

	1907.	1908.	1909.	1910.
First half.....	13,478,044	8,918,004	11,022,346	14,978,738
Second half.....	12,303,317	9,018,014	14,773,125	12,319,807
Totals.....	25,781,361	15,936,018	25,795,471	27,298,545

It will be seen that in the year ending June 30, 1910, our pig iron production reached the enormous total of 29,751,863 tons, or more than 2,450,000 tons in excess of the total for the calendar year 1910. The production in the second half of 1910 was 2,658,931 tons, or 21.5 per cent. less than in the first half.

### Steel-Making Iron

The production of Bessemer and low phosphorus pig iron in 1910 was 11,244,612 tons, against 10,557,370 tons in 1909, an increase of 687,242 tons, or over 6.5 per cent. In the second half of 1910 the production was 4,920,729 tons, as compared with 6,323,883 tons in the first half, a decrease of 1,403,154 tons. The production of low phosphorus pig iron alone in 1910 amounted to 259,077 tons, against 212,615 tons in 1909. The production of Bessemer and low phosphorus pig iron in 1910 was 2,595,906 tons less than in the banner year 1906, when it amounted to 13,540,518 tons.

The production of basic pig iron in 1910, not including charcoal of basic quality, was 9,084,520 tons, against 8,250,225 tons in 1909, an increase of 834,295 tons, or over 10.1 per cent. In the second half of 1910 the production amounted to 4,140,578 tons, against 4,943,942 tons in the first half, a decrease of 803,364 tons. The total in 1910 was the largest in our history, the former record year being 1909.

The production of spiegeleisen and ferromanganese in 1910 was 224,431 tons, against 225,040 tons in 1909, a decrease of 609 tons. The production of ferromanganese alone in 1910 was 71,376 tons, against 82,209 tons in 1909. Of spiegeleisen alone the production was 153,055 tons, against 142,831 tons in 1909. In addition several thousand tons of ferrophosphorus was produced in 1909 and 1910.

### Production by Fuels

The production of bituminous coal and coke pig iron in 1910 amounted to 26,255,086 tons, as compared with 24,721,037 tons in 1909, an increase of 1,534,049 tons. In the first half of 1910 the production was 14,382,346 tons and in the second half, 11,872,740 tons. A small quantity of iron made experimentally with manufactured gas is included for 1909 but not for 1910. The production of mixed anthracite and coke pig iron in 1910 amounted to 649,082 tons, as compared with 698,431 tons in 1909, a decrease of 49,349 tons. In the first half of 1910 the production was 376,739 tons and in the second half, 272,343 tons.

The production of pig iron with anthracite coal alone in 1910, included above, amounted to 20,503 tons, against 16,048 tons in 1909.

The production of charcoal pig iron in 1910 was 394,377 tons, against 376,003 tons in 1909, an increase of 18,374 tons. A small quantity of pig iron made with charcoal and electricity is included in the figures for 1909 and 1910. In the first half of 1910 the production amounted to 219,653 tons and in the second half to 174,724 tons. No pig iron was made in 1909 or 1910 with mixed charcoal and coke.

**Sidewalk Lights for Interior Use.**—That sidewalk lights are practical indoors as well as out is demonstrated by the construction of the new Court House of Shelby County, in Memphis, Tenn., where the Raydiant



## TOTAL PRODUCTION OF PIG IRON IN THE UNITED STATES IN 1909 AND 1910.

Statistics collected from the Manufacturers by The American Iron and Steel Association, all in Gross Tons of 2,240 pounds.

Production in 1910, 27,298,545 Gross Tons; in 1909, 25,795,471 Tons; in 1908, 15,936,018 Tons; and in 1907, 25,781,361 Tons.

## Total Production of All Kinds of Pig Iron.

TOTAL PRODUCTION OF PIG IRON BY STATES.							
States	Blast Furnaces.			Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.)			
	In blast June 30, 1910.	Dec. 31, 1910.		First half of 1910.	Second half of 1910.	Total for 1910.	
		In.	Out.				Total.
Massachusetts.....	1	1	1	2	7,505	9,077	16,582
Connecticut.....	2	3	0	3			
New York.....	18	15	14	29	1,017,951	920,456	1,938,407
New Jersey.....	3	2	7	9	155,087	109,694	264,781
Pennsylvania.....	116	74	90	164	6,065,688	5,206,432	11,272,120
Maryland.....	4	2	3	5	170,708	155,506	326,214
Virginia.....	11	9	17	26	244,275	200,701	444,976
Georgia.....	0	1	3	4	6,725	4,000	10,725
Texas.....	0	0	4	4			
Alabama.....	24	20	30	50	1,012,545	926,602	1,939,147
West Virginia.....	1	1	3	4	137,439	37,222	174,661
Kentucky.....	3	2	6	8	46,520	53,989	100,509
Tennessee.....	12	10	10	20	235,969	161,600	397,569
Ohio.....	50	35	41	76	3,210,562	2,540,505	5,751,067
Illinois.....	20	11	15	26	1,552,160	1,123,486	2,675,646
Indiana.....	6	3	6	9	716,832	533,271	1,250,103
Michigan.....	11	9	7	16			
Wisconsin.....	4	4	3	7			
Minnesota.....	1	1	0	1	170,814	136,612	307,426
Missouri.....	2	1	1	2			
Colorado.....	4	2	4	6			
Oregon.....	0	0	1	1	227,958	200,654	428,612
Washington.....	0	0	1	1			
California.....	0	0	0	0			
Total.....	293	206	267	473	14,978,738	12,319,807	27,298,545

## PRODUCTION OF BITUMINOUS COAL AND COKE PIG IRON.

New York	18	15	7	22	1,017,901	920,466	1,938,357
New Jersey	3	2	5	7	152,975	109,694	262,669
Pennsylvania	98	61	62	123	5,688,738	4,932,270	10,621,008
Maryland	4	2	2	4	170,108	155,506	325,614
Virginia	11	8	14	22			
Georgia	0	1	1	2	247,731	202,611	450,342
Texas	0	0	3	3			
Alabama	23	17	28	45	997,206	906,237	1,903,443
West Virginia	1	1	3	4	137,439	37,222	174,661
Kentucky	2	2	5	7	45,963	52,988	98,951
Tennessee	11	9	9	18	234,393	159,685	394,078
Ohio	49	35	36	71	3,210,542	2,539,465	5,750,007
Illinois	20	11	15	26	1,552,160	1,123,486	2,675,646
Indiana	6	3	6	9			
Michigan	2	1	3	4	673,580	520,442	1,194,022
Wisconsin	3	3	3	6			
Minnesota	1	1	0	1			
Missouri	1	0	1	1	253,610	212,678	466,288
Colorado	4	2	4	6			
Washington	0	0	1	1			
Total	257	174	208	382	14,382,346	11,872,740	26,255,086

## ANTHRACITE AND MIXED ANTHRACITE AND COKE PIG IRON.

New York	0	0	5	5			
New Jersey	0	0	2	2	376,739	272,343	649,082
Pennsylvania	14	10	25	35			
Total	14	10	32	42	376,739	272,343	649,082

## PRODUCTION OF CHARCOAL PIG IRON BY STATES.

Massachusetts	1	1	1	2			
Connecticut	2	3	0	3	*7,555	9,077	*16,632
New York	0	0	2	2			
Pennsylvania	4	3	3	6	2,323	1,819	4,142
Maryland	0	0	1	1	965	590	1,555
Virginia	0	1	3	4			
Alabama	1	3	2	5	15,339	20,365	35,704
Georgia	0	0	2	2			
Texas	0	0	1	1	5,037	4,416	9,453
Kentucky	1	0	1	1			
Tennessee	1	1	1	2			
Ohio	1	0	5	5	20	1,040	1,060
Michigan	9	8	4	12	155,740	105,065	260,805
Wisconsin	1	1	0	1			
Minnesota	1	1	0	1			
Missouri	0	0	1	1	*32,674	*32,352	*65,026
Oregon	0	0	0	0			
California	0	0	1	1			
Total	22	22	27	49	*219,653	*174,724	*394,377

\* Includes a small quantity of pig iron made with charcoal and electricity.

## TOTAL PRODUCTION OF PIG IRON ACCORDING TO FUEL USED.

Bituminous	257	174	208	382	14,382,346	11,872,740	26,255,086
Anth. & anth. & coke	14	10	32	42	376,739	272,343	649,082
Charcoal	22	22	27	49	219,653	174,724	394,377
Total	293	206	267	473	14,978,738	12,319,807	27,298,545

## Miscellaneous Pig Iron Statistics.

## PRODUCTION OF PIG IRON IN PENNSYLVANIA AND OHIO.

Districts.		Blast Furnaces.			Production—Gross tons. (Includes spiegeleisen, ferro-manganese, ferro-silicon, ferro-phosphorus, etc.)			
		In blast June 30, 1910.	Dec. 31, 1910.		First half of 1910.	Second half of 1910.	Total for 1910.	
			In.	Out.				Total.
Pennsylvania.	Lehigh Valley.	16	12	14	26	369,529	389,721	759,250
	Schuylkill " ..	10	8	9	17	404,583	398,779	803,362
	L. Susq. " ..	10	8	9	17	358,511	284,759	643,270
	Junata " ..	3	3	6	9	93,557	97,997	191,554
	Allegheny Co.	38	23	24	47	2,895,729	2,435,169	5,330,898
	Shenango Valley	20	9	14	23	1,041,381	883,138	1,924,519
	Miscel. bitum.	15	8	11	19	900,075	715,050	1,615,125
	Charcoal	4	3	3	6	2,323	1,819	4,142
	Mahoning Val.	20	14	9	23	1,345,926	1,189,043	2,534,969
	Hocking " ..	0	0	1	1	866,805	607,660	1,474,465
Ohio.	Lake Counties	10	6	10	16			
	Miscel. bitum.	10	8	8	16	722,360	562,370	1,284,730
	H. R. bitum.	9	7	8	15	275,451	180,392	455,843
	H. R. charcoal.	1	0	5	5	20	1,040	1,060

## PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON.

New York	464,263	370,369	834,632
Pennsylvania	2,466,797	1,927,110	4,393,907
Maryland	170,108	155,506	325,614
Virginia, West Va., Kentucky, and Tenn.	184,281	84,296	268,577
Ohio	1,942,374	1,517,330	3,459,704
Illinois	1,035,681	790,726	1,826,407
Michigan, Wisconsin, Minn., Col., and Cal.	60,379	75,392	135,771
Total	6,323,883	4,920,729	11,244,612

## PRODUCTION OF BESSEMER AND LOW-PHOSPHORUS PIG IRON IN PENNSYLVANIA AND OHIO BY DISTRICTS.

Lehigh Valley	88,370	76,606	164,976
Schuylkill Valley			
Lower Susquehanna Valley	59,374	67,089	126,463
Allegheny County	1,322,242	1,029,909	2,352,151
Shenango Valley			
Miscellaneous bituminous	996,811	753,506	1,750,317
Mahoning Valley	873,483	865,424	1,738,907
Lake Counties	505,261	326,673	831,934
Hanging Rock bituminous			
Miscellaneous bituminous	563,630	326,233	889,863

## PRODUCTION OF BASIC PIG IRON, NOT INCLUDING CHARCOAL IRON.

New York and New Jersey	274,032	140,196	414,228
Pennsylvania—Allegheny County	1,480,013	1,327,452	2,807,465
Other counties	1,228,391	1,211,134	2,439,525
Virginia and Alabama	392,559	304,818	697,377
Ohio	612,331	543,090	1,155,421
Indiana, Illinois, Missouri, and Colorado	956,616	613,888	1,570,504
Total	4,943,942	4,140,578	9,084,520

## PRODUCTION OF SPIEGELEISEN AND FERRO-MANGANESE.

Pennsylvania	91,381	65,218	156,599
Illinois	39,566	28,266	67,832
Total	130,947	93,484	224,431

## PRODUCTION OF ALL KINDS OF PIG IRON FROM 1906 TO 1910.

States—Gross tons.	Production—(Includes spiegeleisen, ferro-manganese, etc.)				
	1906.	1907.	1908.	1909.	1910.
Massachusetts	20,239	19,119	13,794	18,388	16,582
Connecticut					
New York	1,552,659	1,659,752	1,019,496	1,733,675	1,938,407
New Jersey	379,390	373,189	225,372	294,474	264,781
Pennsylvania	11,247,869	11,348,549	6,987,191	10,918,824	11,272,120
Maryland	386,709	411,833	183,502	286,856	326,214
Virginia	483,525	478,771	320,468	391,134	444,976
Georgia					
Texas	92,599	55,825	24,345	26,072	10,725
Alabama	1,674,848	1,686,674	1,397,014	1,703,617	1,939,147
West Virginia	304,534	291,066	65,551	228,282	174,661
Kentucky	98,127	127,946	45,096	86,371	100,509
Tennessee	426,874	393,106	290,826	333,845	397,569
Ohio	5,327,133	5,260,687	2,861,325	5,551,545	5,751,067
Illinois	2,156,806	2,467,768	1,691,944	2,467,156	2,675,646
Indiana					
Michigan	369,456	436,507	248,096	964,289	1,250,103
Wisconsin					
Minnesota	373,323	322,083	148,938	348,177	307,426
Missouri					
Colorado					
Washington	413,040	468,486	313,071	392,766	428,612
California					
Total	25,807,191	25,781,361	15,936,018	25,795,471	27,298,545

sidewalk lights manufactured by the Berger Mfg. Company, Canton, Ohio, are in use. The lights were installed largely in the courts of the huge building, which is one of the handsomest in the South. The cost of the building was \$1,500,000. The architects for the Court House were Hale & Rogers, New York. Perfect light is an essential in a county hall of justice, and it was only after a thorough test and demonstration of the light giving qualities of the Raydiant system that the lights were contracted for.

Work will be started shortly on the large extensions and improvements at the Pittsburgh Steel Company's plant at Monessen, Pa., comprising, it is understood, four 400-ton blast furnaces and two or more open hearth furnaces. Two blast furnaces will probably be completed first and two more will quickly follow. The company will then be independent of the pig iron market. It has for some time been buying all its requirements of basic pig iron from the Shenango Furnace Company, Sharpsville, Pa., and M. A. Hanna & Co., Cleveland, Ohio.

## Results with Dry Air Blast

### Great Uniformity in Moisture and Temperature— Fuel Saving with Increased Output

Some recent data of dry air blast operations, furnished by James Gayley, are given below. Mr. Gayley states that they are from a Western furnace plant, for the months of June, July and August, 1910. These months represent the period of greatest humidity and demonstrate the efficiency of the Gayley process under careful management for producing a dry air blast that is uniform to a remarkable degree, both in contents of moisture and in temperature. While the atmosphere varies widely in both temperature and moisture, the variations in the dry air are within narrow limits, and approach as close to uniformity as seems possible to obtain in a mechanical device that is treating 40,000 cu. ft. of air per minute.

The amount of work done by a dry air plant in mid-summer in removing moisture is ordinarily not fully comprehended by simply expressing the moisture content in grains per cubic foot of air. In a furnace consuming 40,000 cu. ft. of air per minute the presence of 1 grain represents the delivery of 41.2 grains of water per hour to the furnace. Taking, for example, a very humid day, July 6, when the moisture as shown in Table 2, averaged 7.90 grains for the day and night, there would have entered the furnace under natural air conditions 7797 gal. of water in the 24 hours. This would be the equivalent of 185.6 barrels. The dry air on the same day contained only 0.86 grain, and the quantity of water entering the furnace was accordingly reduced to 849 gal., thereby eliminating 6948 gal., and saving the fuel necessary to dissipate it. Taking again the day with the lowest humidity, July 19, when the moisture for day and night averaged 3.45 grains, the furnace would have received 3410 gal. of water, but the dry air carried in only 809 gal., representing an abstraction of 2601 gal. Thus, even on days of relatively low humidity, the quantity of water extracted is very large.

Table 1.—Record of Operations of Dry Blast Process at a Western Furnace.

Grains of moisture per cubic feet air.							Temperature (Degrees F.)			
1910. Atmosphere.		Dry blast.		Atmosphere.		Dry blast.				
June.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.		
1.....	2.88	2.97	0.84	0.80	47	50	15	16		
2.....	3.03	3.01	0.82	0.83	53	50	15	15		
3.....	3.10	3.16	0.85	0.84	55	51	15	16		
4.....	3.06	3.87	0.82	0.84	56	55	16	16		
5.....	4.56	3.85	0.84	0.80	59	53	16.3	16		
6.....	4.27	3.70	0.83	0.80	60	53	16.3	15		
7.....	3.42	3.44	0.85	0.82	62	59	16.1	16		
8.....	3.78	3.91	0.85	0.83	66	59	17	17		
9.....	3.08	3.77	0.87	0.84	70	61	17.3	18		
10.....	4.33	4.32	0.85	0.82	62	61	17.7	19.6		
11.....	4.60	4.12	0.84	0.84	60	55	17.5	18.8		
12.....	3.84	4.07	0.86	0.85	68	60	18.7	18.1		
13.....	3.97	3.80	0.86	0.86	76	67	19.1	17.3		
14.....	4.17	4.53	0.87	0.87	77	73	18.9	18.1		
15.....	4.62	4.60	0.87	0.83	81	72	18.8	17.6		
16.....	4.79	4.36	0.85	0.85	82	71	19.7	18.2		
17.....	4.39	4.99	0.85	0.85	85	76	19.7	18.2		
18.....	5.75	5.92	0.86	0.85	87	74	19.6	19		
19.....	5.99	6.33	0.83	0.84	83	71	19	18.4		
20.....	6.52	6.61	0.86	0.84	83	74	20	19.3		
21.....	6.54	5.76	0.83	0.83	83	73	19	18.9		
22.....	4.68	5.38	0.81	0.84	83	74	19.5	19		
23.....	5.82	6.36	0.86	0.86	89	84	20	19		
24.....	5.79	4.93	0.83	0.82	76	68	19.6	17.8		
25.....	4.39	5.07	0.80	0.79	78	69	18.5	17.6		
26.....	5.45	5.58	0.81	0.83	80	74	18.3	19		
27.....	5.97	6.20	0.85	0.82	72	65	21.8	19		
28.....	4.19	5.07	0.82	0.82	80	74	16.7	18		
29.....	5.50	5.84	0.85	0.84	79	73	18	19		
30.....	5.91	6.08	0.87	0.89	87	80	19	20		

Table 2.—Record of Operations of Dry Blast Process at a Western Furnace.

Grains of moisture per cubic feet air.						Temperature (Degrees F.)				
1910.		Atmosphere.		Dry blast.		Atmosphere.		Dry blast.		
July.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
1.....	5.37	5.46	0.85	0.84	91	79	18.5	19		
2.....	5.09	6.10	0.86	0.86	89	79	18	19.5		
3.....	6.06	4.96	0.85	0.83	82	71	19	18.5		
4.....	4.43	4.56	0.84	0.81	72	68	16	16		

Grains of moisture per cubic foot air.

1910.		Atmosphere.		Dry blast.		Atmosphere.		Dry blast.		Temperature (Degrees F.)		
July.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
5.....	5.14	5.99	0.82	0.85	77	71	77	71	17.8	19	17.8	19
6.....	7.96	7.84	0.86	0.86	77	70	77	70	21	21	21	21
7.....	6.24	6.56	0.86	0.85	82	70	82	70	19.5	20	19.5	20
8.....	5.31	6.59	0.79	0.83	86	76	86	76	18	20	18	20
9.....	6.47	6.97	0.86	0.82	86	74	86	74	20	19	20	19
10.....	6.76	5.37	0.84	0.82	81	69	81	69	20	18	20	18
11.....	4.25	4.89	0.82	0.77	82	73	82	73	19	18	19	18
12.....	7.03	5.54	0.84	0.79	79	71	79	71	20.5	19	20.5	19
13.....	3.91	4.20	0.78	0.80	74	65	74	65	16	15.4	16	15.4
14.....	4.40	5.15	0.79	0.80	78	70	78	70	18	17.6	18	17.6
15.....	5.57	6.24	0.81	0.83	83	75	83	75	19	19	19	19
16.....	5.68	5.51	0.85	0.81	84	70	84	70	18	18	18	18
17.....	4.03	4.31	0.79	0.85	74	66	74	66	17	17.7	17	17.7
18.....	3.73	3.54	0.81	0.83	75	65	75	65	17	14.7	17	14.7
19.....	3.54	3.37	0.80	0.84	75	66	75	66	16	15	16	15
20.....	3.48	4.35	0.81	0.85	70	73	70	73	17	18	17	18
21.....	6.07	6.33	0.82	0.82	78	71	78	71	19	17.5	19	17.5
22.....	4.52	4.96	0.83	0.82	84	75	84	75	18.5	18	18.5	18
23.....	6.04	5.87	0.83	0.82	85	77	85	77	18	17	18	17
24.....	6.21	6.61	0.84	0.85	85	77	85	77	18.5	19	18.5	19
25.....	5.28	5.16	0.83	0.83	83	72	83	72	16	17	16	17
26.....	7.28	5.79	0.85	0.83	82	71	82	71	19.2	18	19.2	18
27.....	5.58	6.10	0.80	0.84	80	71	80	71	17	18	17	18
28.....	5.31	5.74	0.82	0.82	81	71	81	71	18.3	18.7	18.3	18.7
29.....	6.47	7.06	0.82	0.84	82	75	82	75	19.2	20	19.2	20
30.....	4.43	4.74	0.83	0.79	81	70	81	70	18	18.5	18	18.5
31.....	4.40	4.29	0.81	0.78	75	66	75	66	18.5	17	18.5	17

Table 3.—Record of Operations of Dry Blast Process at a Western Furnace.

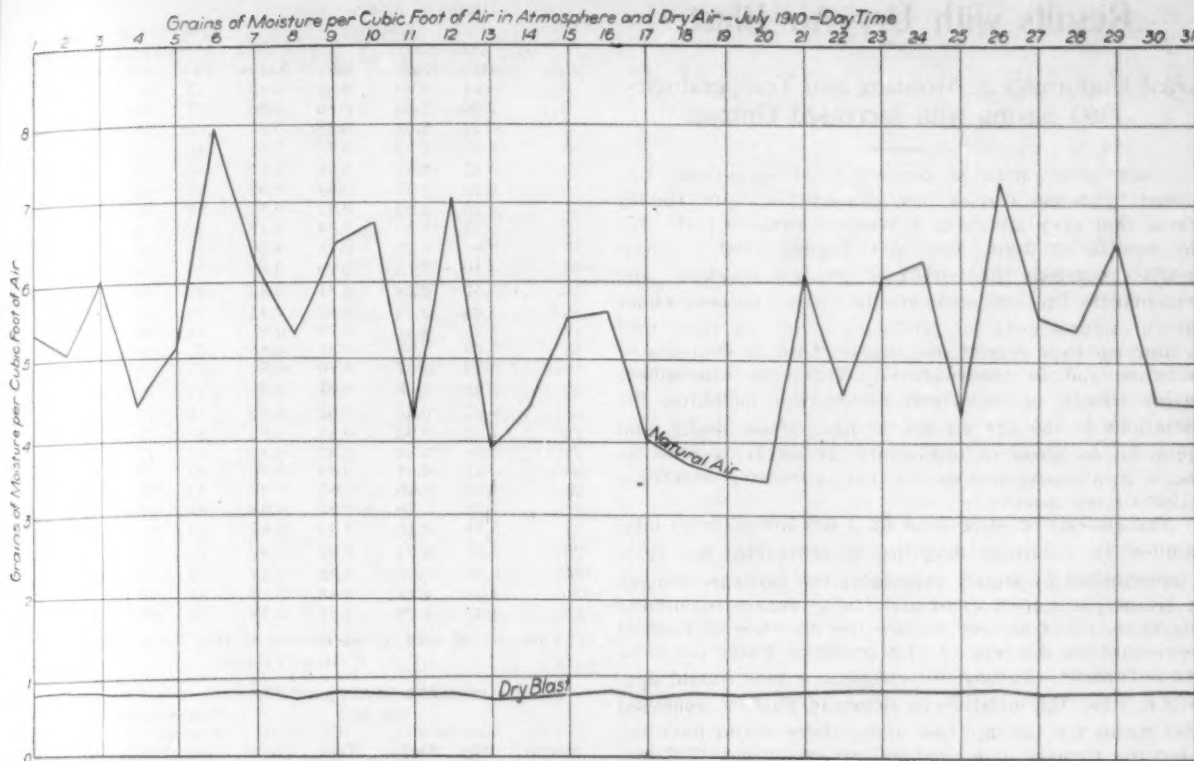
Grains of moisture per cubic foot air.						Temperature (Degrees F.)		
1910. Atmosphere.		Dry blast.		Atmosphere.		Dry blast.		
August.	Day.	Night.	Day.	Night.	Day.	Night.	Day.	Night.
1.....	3.96	5.86	0.87	0.82	79	71	17	18.5
2.....	6.98	7.14	0.83	0.83	78	72	18	18.5
3.....	6.04	5.67	0.84	0.83	84	77	17.1	18.5
4.....	4.41	3.70	0.83	0.77	76	63	16	16.4
5.....	3.34	3.30	0.80	0.77	73	75	15.5	15
6.....	3.41	4.57	0.82	0.81	79	73	17	18
7.....	5.02	4.92	0.84	0.81	74	68	16.7	16.3
8.....	4.58	4.85	0.82	0.84	80	70	17.4	16.4
9.....	5.21	5.64	0.85	0.84	76	69	18	18
10.....	4.82	5.13	0.81	0.82	78	69	17	16.9
11.....	4.95	5.15	0.82	0.84	77	68	18	17
12.....	3.88	5.19	0.81	0.83	78	66	18	18.4
13.....	4.63	4.55	0.85	0.83	82	72	18.4	17.8
14.....	4.39	5.34	0.82	0.83	86	76	19	18
15.....	5.11	7.13	0.83	0.83	87	78	19	19.7
16.....	7.09	6.19	0.85	0.85	83	76	20	18
17.....	6.55	6.64	0.87	0.86	89	79	18.5	18.5
18.....	6.40	5.15	0.85	0.84	76	68	19.5	17
19.....	4.05	4.01	0.84	0.84	76	66	18	16
20.....	4.20	4.72	0.81	0.86	74	66	17	16
21.....	4.68	5.37	0.85	0.84	81	71	18	18
22.....	6.12	5.94	0.85	0.85	79	75	17	18.5
23.....	5.96	6.11	0.85	0.85	75	74	17	18
24.....	5.43	5.63	0.83	0.84	87	79	17.5	18.5
25.....	6.94	4.12	0.86	0.79	80	60	19.5	18
26.....	3.47	3.77	0.85	0.79	66	59	17	18
27.....	3.15	3.96	0.84	0.80	71	62	16.7	18
28.....	4.56	5.32	0.85	0.85	73	68	18	19
29.....	5.60	6.39	0.86	0.85	74	71	18.5	19.4
30.....	5.90	6.06	0.86	0.84	84	78	20	19.5
31.....	5.54	4.26	0.84	0.80	73	67	17	17

The amount of water extracted through the dry air process expressed in gallons as seen in Table No. 4 is very impressive, and will be particularly appreciated by practical blast furnace managers who are familiar with the cooling effect produced in the furnace hearth from a small leak from a tuyere or bosh plate. The diagram shows graphically the grains of moisture in the atmosphere and the resulting dry air. The uniformity of the dry air speaks for itself, as to its value in a process so delicate in adjustment and so variable as a blast furnace.

When the results of dry air were first made public in 1904 it was thought by some that the economical results obtained were not due so much to low moisture in the dry blast, as they were to creating conditions of uniformity in the moisture—that is, if the moisture was maintained uniformly at 2 to 2.50 grains or 3 grains, the results would be practically as good as if it was reduced to 1.5 grains. This, however, does not appear to be borne out in actual practice, as the best results are obtained when the moisture is reduced below 1 grain per cubic foot of air, and is markedly greater at 0.75 grain than at 1.50 grains. The reasons for this do not seem at present to be clearly understood, although it has been demonstrated in practice.

The conclusion reached from the experience of the past





Results with the Gayley Dry Blast. Graphic Chart of the Performance of a Western Dry Blast Plant for the 31 Days of July, 1910, Showing High and Varying Moisture in the Atmosphere and Low and Uniform Moisture in the Resulting Dry Air.

six years is that dry air blast conservatively considered will effect a saving of 10 per cent. in fuel, with an increase in output of 12 per cent., and the product can be increased beyond this at the expense of fuel saving, and vice versa. The tendency in some cases is to increase the output at the expense of fuel saving. At one works the saving in coke was 7.5 per cent. on dry air, but concurrently the output was increased by 23 per cent. Thus the dry air blast not only reduces the cost of pig iron, but it also creates uniformity in the furnace operations, and any cheapening of the pig iron cost is reflected to a greater extent in the finished steel product.

Table 4.—Gallons of Water Delivered to Furnace in 24 Hours.

With		With dry		With		With dry	
natural air.		blast.		natural air.		blast.	
July, 1910	Gallons.	Gallons.		July, 1910.	Gallons.	Gallons.	
1.....	5,349	834		17.....	4,116	809	
2.....	5,517	849		18.....	3,588	800	
3.....	5,438	829		19.....	3,410	809	
4.....	4,432	814		20.....	3,915	819	
5.....	5,488	844		21.....	6,119	809	
6.....	7,797	849		22.....	4,678	814	
7.....	5,428	844		23.....	5,876	814	
8.....	5,873	799		24.....	6,327	834	
9.....	6,033	829		25.....	5,152	819	
10.....	5,981	819		26.....	6,450	829	
11.....	4,511	785		27.....	5,764	809	
12.....	6,203	804		28.....	5,453	809	
13.....	4,002	779		29.....	6,184	819	
14.....	4,713	785		30.....	4,525	799	
15.....	5,828	809		31.....	4,288	782	
16.....	5,522	819					
Total, July.....					164,560		25,254
Equivalent in barrels of 42 gal. each.....					3,918		601

the center, the cranes delivering everything to the tracks located in this building. The entire plant when completed will cover an area of about 4 acres. The company conducts a business as engineer, founder and machinist.

The Sherman Machine & Iron Company, now located at 18 to 36 East Main street, Oklahoma City, Okla., has secured a tract of five acres on East Fourth street, near the Missouri, Kansas & Texas Railroad, on which it will erect a new plant on which building operations will be commenced shortly. The buildings will comprise a foundry, machine shop, storage warehouse, boiler shop, wood-working shop and various other structures, including an office. On the old site thus vacated the N. S. Sherman Warehouse Company will erect a fireproof warehouse, 140 x 240 ft., six stories; the incorporators of this company are N. S. Sherman, Sr., N. S. Sherman, Jr., W. S. Sherman, N. V. Hope and R. V. Moran.

The Winnipeg Development and Industrial Bureau, Winnipeg, Canada, has issued an illustrated brochure entitled "The Corner Posts of a Great City." The illustrations show imposing structures which have been erected at the corners of prominent streets in that city. They are most impressive in indicating the importance of the business interests of this enterprising city of the far North which in 1870 had a population of only 215 and at present has a population, including suburbs, of 185,000. Reports on the manufacturing possibilities of the city and vicinity are furnished free of charge by Charles F. Roland, Commissioner, Union Bank Building, Winnipeg.

The Chase Foundry & Mfg. Company, Columbus, Ohio, manufacturer of roller bearing trucks, industrial cars and industrial railroad equipment generally, held its annual stockholders' meeting January 14, at which time the old Board of Directors was re-elected. P. A. Myers of the firm of F. E. Myers & Bro., Ashland, Ohio, was elected president; Guy C. Myers, Ashland, Ohio, vice-president; S. M. Chase, Columbus, Ohio, secretary and general manager. The business for 1910 was found to be most satisfactory, and there is an exceptionally good outlook for the coming year.

**The Webster Mfg. Company's Improvements.**—The Webster Mfg. Company, Chicago, is making extensive additions to its plant at Tiffin, Ohio. The plans cover a malleable iron foundry and sheet iron works, occupying two buildings, 120 x 330 ft. each.; a machine shop, 120 x 300 ft.; storage and shipping building, 90 x 270 ft.; office building, 100 x 250 ft.; foundry, 120 x 300 ft.; pattern vault, 100 x 120 ft. The buildings are to be of one story, of brick and steel truss construction, and will be fitted with electric cranes and the most modern methods for lighting, heating, &c. There will also be a large air equipment for handling various tools with air compressors. The plan of the shop is to work everything to the center, the shipping and storage rooms being in

## Canadian Steel Interests and Reciprocity

TORONTO, January 30, 1911.—The reciprocity arrangement that is now before the Parliament of Canada and the United States Congress does not very materially affect the iron and steel industries of this country. In most cases the reduction in the Canadian duties goes no lower than the level of the intermediate tariff. Wire rods were and long have been on Canada's free list, but wire rods entering the United States are subject to duty. As under the agreement Canadian wire rods would be free to enter the United States, that item is in Canada's favor.

The Canadian bounty on wire rods will cease at the end of next June, unless in the meantime Parliament provides for its continuance. In some quarters it is thought that Parliament may do so, though before the terms of this agreement were made public there seemed ground for the expectation that the Government would compensate the manufacturers for the withdrawal of the bounty by transferring rods from the free to the dutiable list. The agreement negatives such a mode of indemnifying the rod manufacturers for the loss of the bounty, and it is thought doubtful that entrance to the United States market will prove an equivalent. Hence there is a revival of the notion that the bounty may be renewed.

The numerous articles included under the name of agricultural machinery would undoubtedly be more freely imported from the United States were the agreement to be adopted. Lloyd Harris, M. P. of the Massey-Harris Company, with whose Brantford works he is most closely associated, is quoted as saying that the reductions would not hurt the farm machinery industry. It is to be remembered that pig iron, rolled iron and rolled steel are already entitled to a drawback of 99 per cent. of the Canadian duty when they are used in the manufacture in Canada of mowing machines, reapers, harvesters, binders and attachments. This is worth more to the agricultural implement makers than some additional percentage ad valorem in the way of tariff protection on their products. Type casting and type setting machines, which are dutiable at 20 per cent. under Canada's general tariff, would come free from the United States under the reciprocity agreement. At the same time they would remain dutiable at 12½ per cent. coming from Great Britain, that rate being the one specified in Canada's preferential tariff. American brass in bars and rods, not less than 6 ft. in length, or brass in strips, sheets or plates, not polished, planished or coated, would be free under the agreement, whereas, coming from Great Britain it would remain dutiable at its present rate of 5 per cent. ad valorem.

C. A. C. J.

## The Canadian Railway Club Meeting

A number of machinery and railroad supply men from the United States attended the meeting of the Canadian Railway Club, January 27, at Windsor Hall, Montreal, being particularly interested because of the flourishing condition of Canadian railroad business. A. A. Maver, master mechanic of the Grand Trunk Railroad, is president of the association. The speaker of the evening was G. J. Phillips, superintendent of the Lackawanna Railroad, who, in response to the toast, "The Railways," called attention to the fact that the Canadian railroads are on a sound financial basis and said: "We in the United States have to spend many millions of money yet in making our railroad facilities meet the demands of the time and are now asking that we be helped to earn the money to meet these demands. We have made many mistakes, I admit, but the biggest mistake is, I think, that we have not built big enough." H. H. Vaughn, assistant to the vice-president of the Canadian Pacific Railroad, in responding to the toast, "Our Guests," spoke of the cordial feeling existing between Canadian railroad men and American machinery and supply manufacturers. G. H. Pearsall, secretary of Joseph T. Ryer-

son & Son, Chicago, answered the toast to the supply men.

## A Blooming Mill with Novel Features

The United Engineering & Foundry Company, Farmers' Bank Building, Pittsburgh, has completed and is shipping this week to the Republic Iron & Steel Company at East Youngstown, Ohio, a 40-in. two-high blooming mill, in which have been incorporated some novel features. The mill is practically a duplicate of the blooming mill built last summer by the same company for the American Rolling Mill Company and installed at its East Works near Middletown, Ohio. Its special features are briefly as follows:

In designing the housing, the ordinary practice of a parallel window was not used, but the housing was given more or less the shape of an A-frame, with the object of having a wide window at the bottom and maintaining a narrow opening at the top where the bending stress of the housing is very severe; as the wide bottom of the window would similarly cause heavy bending stress, this part of the housing was formed in the shape of a link, being filled in by a very rigid cast steel block which carries the bottom roll bearing. This arrangement causes the housing to take the form of a huge stirrup, which is subject almost entirely to tensile stress rather than bending.

As the window of the housing has considerable width at its lower part, it has been found possible, by a special arrangement of the table, to have the first roller of the mill tables pass through the window and receive its support from the table girders, so that it is unnecessary to have any rollers passing through the housing posts. This feature is considered highly valuable, as table rollers passing through the housing posts invariably cause difficulties in operation. If such a roller is bent in the journals, it is very difficult to remove, and usually causes delays of the mill, whereas with the arrangement just described it is only necessary to raise the top roll and remove the bent roller through the housing window.

The arrangement of counterbalance is also somewhat novel, consisting of a hydraulic cylinder placed between the housings which operates through links to a pair of beams, which in turn carry the top roll. In this construction no bolts or other threaded members are used, these having been replaced by links with forged heads between the balance beams and the cylinders and by heavy hook liners between the beams and the roll carrier.

In changing rolls, the top roll is lowered against the bottom roll and the balance pressure from the cylinder relieved, after which the top roll carriers may be withdrawn from the housings without loosening any bolts or other fastenings. After this is done, pressure is again applied to the balance cylinder and the screws run up, carrying the balance beams and top roll rider with them. This leaves the top roll entirely free to be removed from the window of the housing. The bottom roll may be removed by simply taking off the scale guards and lifting it out through the window.

The screw-down mechanism is operated from a 100-hp. motor through worm gearing and has a lift of 36 in., so that the mill can be used for edging slabs up to this width. The construction of the screw-down is such that, by removing eight bolts and two keys, the entire superstructure may be removed from the mill when repairs to any of its parts are required.

The pinion housings are of specially heavy design, being entirely inclosed so as to be oil tight, and the pinion bearings are of the solid type, having no means of adjustment. The pinion bearings are of such large dimensions that practically no wear will occur, each neck being 22 in. in diameter by 36 in. long in the bearing. The spindles between roll and pinion housings are 20 ft. long, the top spindle being carried by a very substantial arrangement, so constructed that both the carrier and spindle may be quickly removed. The roll housings are of cast steel and weigh 96,000 lb. each. The bed plate weighs 3020 lb. per running foot on each side of the mill. The pinion housings are also of cast steel and weigh 60,000 lb. each, excluding the caps.



## The Demand for Broad Foundry Training

Thomas D. West, Cleveland, Ohio, lectured Thursday evening, January 26, at the School of Applied Industries, Carnegie Technical School, Pittsburgh, on "American Foundry Practice and Its Demands." This was the first of eight lectures which are announced by this school to be given in the next four months. Mr. West presented 38 illustrations in the form of lantern slides, indicating the great variety of work compassed in modern foundry operations. A list of specialties in iron and steel castings, which accompanied the lecture, contained 50 classes of work, ranging from locks, hinges and toys to the heaviest engines, mining machinery and electric generators. Mr. West emphasized what he has been advocating for several years—namely, the training of young men for the career of master founders. He feared that the prominence of specialties nowadays and the deplorable unwillingness of young men to devote the time that must be spent in the foundry in order really to learn the trade, would result in all-around mastery of foundry practice becoming a lost art. As long as specializing in foundry lines continues to be the rule it was pointed out that the man who systematically sets about acquiring a broad acquaintance with the trade would have a great advantage. The speaker cited his own experience in being called on to extricate specialty founders from difficulties with which, owing to the one-sided character of their training, they could not cope. The speaker deprecated the impression so widespread, and frequently leading to financial disaster, that only ordinary qualifications are required for success in foundry management. He recommended a thorough apprenticeship and a variety of experience in engine or other machinery plants, as well as those doing a general jobbing business, and considered that no city offered better advantages for such broad training than Pittsburgh.

The address took up some of the important classes of foundry work, as cast iron pipe, radiators, electric generators, locomotive castings, malleable castings, car wheels and steel castings, and gave a practical foundryman's description of these various lines of operation. The use of the molding machine in the foundry and the modern advances represented by welding the use of lifting magnets, casting in permanent molds and the use of dies in connection with casting under pressure, were illustrated and described.

## Rifle Shots Open a Chilled Cinder Notch

The blast furnace of the Northern Iron Company at Standish, N. Y., which produces Chateaugay low phosphorus pig iron, recently made a slip, which resulted in the chilling of the cinder notch. The usual method of opening it with coal oil blast lamps was applied, but the material was of such a nature that it did not respond to the heat produced by the blast lamps. Some 8 or 10 barrels of oil were burned, with but little progress more than apparently to soften the chilled material. The furnace at the time was full of iron and slag, and after a number of attempts had been made to drive steel bars through the notch a high power rifle with steel jacketed bullets was effectively tried. Thirty or 40 shots were used to open the notch. This method was also used advantageously on several chilled tuyeres.

The annual meeting of the stockholders of the Standard Underground Cable Company was held in Pittsburgh January 24 and the retiring Board of Directors was re-elected as follows: L. W. Dalzell, John Moorehead, Jr., J. N. Davidson, B. F. Jones, Jr., A. H. Childs, J. W. Marsh, W. A. Conner, F. A. Rinehart and Joseph Wood. The annual report has not yet been given out, but it is understood that the business of the company the past year was most satisfactory.

A creditors' petition in bankruptcy has been filed against the United Bearings Company, Bradford, Pa., by three alleged creditors, whose claims aggregate \$7629.77.

## The California Metal Trades Association's Annual Meeting

The California Metal Trades Association held its fourth annual meeting January 25 in San Francisco, Cal. The retiring president, J. M. Robinson, made his report for the year and in it said:

Every effort was made by this association to gain for its members an agreement along the lines under which you are operating your shops to-day, and its efforts have been successful in having had brought into being an agreement calculated to accomplish for you what we now know was intended by the framers of the former agreement, namely, no discrimination against San Francisco in the matter of hours constituting a work day for employees of shops embraced within the membership of the California Metal Trades Association.

Officers for the ensuing year were elected as follows: President, Sam J. Eva, United Engineering Works; first vice-president, Constant Meese, Meese & Gottfried Company; second vice-president, George J. Henry, Jr., Pelton Water Wheel Company. Executive Committee: C. H. Evans, C. H. Evans & Co.; O. H. Fischer, Union Gas Engine Company; Andrew L. Kerr, Steiger & Kerr Stove & Foundry Company; John A. McGregor, Union Iron Works Company; R. H. Postlewaite, Risdon Iron & Locomotive Works; P. H. Reardon, Compressed Air Machinery Company; Otto Schrader, Schrader Iron Works, Inc.; John T. Scott, Moore & Scott Iron Works.

At an Executive Committee meeting held in New York City last week the dates of the joint conventions of the Southern Hardware Jobbers' Association and the American Hardware Manufacturers' Association were fixed for April 26, 27 and 28. The conventions will be held at San Antonio, Texas, and plans are being made for a special train for the accommodation of members and other visitors, which will start several days in advance of the convention, so as to provide for brief visits en route to some of the principal Southern and Southwestern cities. A special transportation committee is being formed by the American Hardware Manufacturers' Association to make all arrangements for this special train. The personnel of this committee will be announced at an early date.

Stockholders of the Ironton Iron Company, Ironton, Ohio, elected these directors recently: H. A. Marting, W. A. Murdock, F. L. McCauley, D. C. Davies, Dr. C. A. Lowry, E. O. Marting, W. W. Marting and Fred J. Horschell. The directors organized by electing the following officers: H. A. Marting, president and general manager; E. O. Marting, first vice-president; W. A. Murdock, second vice-president, and W. W. Marting, secretary and treasurer.

At the Brown-Bonnell Works of the Republic Iron & Steel Company at Youngstown, Ohio, the Bessemer steel plant, 20-in. and 10-in. skelp mills, the 7-in. and 8-in. continuous mills, the No. 3 bar mill and the spike and washer factories are running this week, while at the Mahoning Valley Works the two bar mills, 7-in. mill, blooming mill and shafting departments are in operation.

Sixteen of the 23 hot tin mills in the Laughlin plant of the American Sheet & Tin Plate Company at Wheeling, W. Va., were put in operation last week for the first time since the plant closed down October 29 last year.

The Delaware Steel Company, Chester, Pa., which recently sold a considerable tonnage of pig iron, is preparing to blow in its furnace. It will probably be ready to go in about February 15.

The Massillon Foundry & Machine Company, Massillon, Ohio, has increased its capital stock from \$50,000 to \$100,000.

The Warwick Iron & Steel Company, Pottstown, Pa., will blow out its No. 2 Furnace about the middle of February.

## Personal

H. A. Dorsey, an instructor in the engineering department, University of Cincinnati, Cincinnati, Ohio, has resigned to take charge of the mechanical department of the Oliver-Schlemmer Company, Cincinnati. A most annoying error was made in referring to Mr. Dorsey last week, his name having then been printed as Foster.

E. J. Codd, formerly president of the E. J. Codd Company, Baltimore, Md., is the head of a new concern, the Codd Tank & Specialty Company, 406 West Camden street.

Edward Blake, Jr., manager of sales for the Wells Brothers Company, Greenfield, Mass., for the past four years, and a director of the corporation, severed his connection with the company February 1. He has obtained the controlling interest in the Canadian Tap & Die Company, Ltd., Galt, Ontario, Canada, of which he has been treasurer since its organization in 1905. He leaves within a few weeks to take the active management of the company's affairs and will devote his entire time to promoting its business. Mr. Blake came from the West nine years ago to enter the employ of the Wells Brothers Company as a stock clerk and acquired a thorough knowledge of the entire line of Little Giant screw thread cutting tools and machinery, which was of great value in his later work. He was promoted to the order department, and from there went through the various departments of the offices to the desk of sales manager and manager of the offices. His work in this capacity was eminently successful and in 1909 he was elected a director.

E. T. Hendee, assistant to the president of Joseph T. Ryerson & Son, Chicago, sailed for Europe February 1, on the Mauretania. He will give special attention to the extension of the foreign business of his company, which has been growing rapidly in recent years.

E. W. Puckett, for the past 10 years president and manager of the Fort Wayne Oil & Supply Company, Fort Wayne, Ind., has accepted the position of vice-president and sales manager of the Republic Belting Company, Cleveland, Ohio, manufacturer of leather belting.

Ernest H. Rowe has been elected secretary of the Coke Producers' Association of the Connellsville Region, First National Bank Building, Uniontown, Pa., succeeding George B. Irwin, who resigned on account of ill health. The office of the association has been combined with the office of the Uniontown Chamber of Commerce, of which Mr. Rowe is also secretary. Although the two organizations as such have not been merged, a common headquarters and secretary are convenient because of the substantial identity of the interests of the two bodies.

V. A. Longaker, Detroit, Mich., who has for the past six years successfully managed the affairs of the American Motor Car Company, has become general manager of the American Motors Company, the new company recently organized to take over and enlarge the properties of the old company.

Jay I. Andrews, general manager of sales of the American Sheet & Tin Plate Company, Pittsburgh, is now on the Pacific Coast on business. He expects to return about February 15.

W. W. Broughton, St. Paul, Minn., has been elected vice-president of the Pittsburgh Coal Company, succeeding C. E. Wales, resigned. Mr. Broughton recently resigned the position of general traffic manager of the Great Northern Railroad.

E. W. Mudge of E. W. Mudge & Co., iron and steel factors, Frick Building, Pittsburgh, and district representatives for the La Belle Iron Works, Steubenville, Ohio, and Lackawanna Steel Company, Buffalo, N. Y., has sailed for Europe.

W. P. Murray of Pickands, Mather & Co., Cleveland, has gone to Cuba to spend several weeks.

Wilmer Wickersham, for some years sales agent of the Pope Tin Plate Company, Pittsburgh, mills at Steubenville, Ohio, has resigned, effective February 1. He has had a long and successful experience in the tin plate trade

from the selling standpoint, and while he has not definitely made plans for the future he expects to continue in this line of business.

Jay Pickands of Pickands, Mather & Co., Cleveland, is spending several weeks in Bermuda.

Price McKinney of Corrigan, McKinney & Co., Cleveland, has gone to Mexico, where he will remain several weeks.

President James A. Farrell of the United States Steel Corporation will deliver an address before the Pan-American Commercial Conference, held under the auspices of the Pan-American Union, at Washington, Monday, February 13. Addresses will also be made by President Taft, Secretary Knox, Senator Root, Champ Clark and Latin-American diplomatic representatives.

Exile Burkitt has resigned as general manager of the Southern Engine & Boiler Works, Jackson, Tenn., to become manager of the Southern Motor Works at Nashville, Tenn.

## Obituary

GEORGE W. FIFIELD, Lowell, Mass., prominent as a machine tool builder for many years, died January 30.

CALVIN B. ORCUTT, president of the Newport News Shipbuilding & Dry Dock Company and of the Baltimore & Ohio Coal Company, died January 30 at Johns Hopkins Hospital, Baltimore, where he had gone for an operation. Mr. Orcutt had lived in Elizabeth, N. J., all his life. He was president for many years of the local Y. M. C. A. and an elder in the Second Presbyterian Church. He was an expert in shipbuilding.

JEREMIAH J. KEENAN, one of the oldest and best known boiler makers in northern Ohio, owner of the Lake Erie Boiler Works, Cleveland, which he established 25 years ago, died at his home in Cleveland, January 27, aged 72 years.

JAMES MILLS NASH, superintendent of the wire department of the plant of the Pittsburgh Steel Company at Monessen, Pa., and a brother of George Nash, general superintendent, died January 30, aged 47 years. He was born in Pembroke, Wales, and in 1887 came to this country, settling in St. Louis, Mo., where he worked in the wire mills. Three years later he went to Rankin, where he was placed in charge of the wire department of the American Steel & Wire Company. During President McKinley's administration he served as postmaster of Rankin, and was a Councilman there for two years. He leaves a widow.

BENJAMIN K. LIVERIGHT, of the firm of Liveright Brothers, file manufacturers, Philadelphia, Pa., died suddenly from paralysis of the heart at his home in that city January 28, aged 32 years.

The plants of the Dover Forge & Iron Company and the Reeves Mfg. Company, Canal Dover, Ohio, will be merged, according to reports from that city, and three new tin mills will be added to the plant of the first named company.

The first West Siberian Exposition of the product of agriculture, forestry and industry is to be held at Omsk, Siberia, this year, opening June 28 and closing August 14. It will be conducted under the auspices of the Moscow Agricultural Society. The main purpose of this exposition is to acquaint visitors with the vast natural richness of the territory of West Siberia; also to provide opportunities for the display of improved agricultural and other implements, machinery, &c. Further information can be secured from the Russian-American Messenger, 102-104 West Thirty-eighth street, New York.

The McKeesport Tin Plate Company, McKeesport, Pa., has completed two new tin mills and now has 22 hot mills in one plant, making it the largest single independent tin plate plant in the country. The company expects to have the entire number of mills in operation shortly.



## The Reciprocity Agreement with Canada

The provisions of the proposed reciprocity agreement with Canada have been made public by the transmission of the document by President Taft to Congress, with an accompanying message urging its adoption. The agreement covers a long list of food products which are either made free or subjected to considerably decreased rates of duty. It also includes a number of manufactured articles. We have taken from the schedules, as shown by the accompanying tables, the articles affected by the agreement which are of special interest to our readers:

### Mineral or Metal Products to Be Free of Duty.

	Present United States duty.	Present Canadian duty.
Gypsum, crude.....	30c. ton.	30c. ton.
Mica, unmanufactured.....	5c. lb. + 20 %	17½ %
Feldspar, crude.....	Free	Free
Feldspar, ground.....	35 %	35 %
Asbestos, not further manufactured than ground.....	Free	.....
Fluorspar, crude, not ground.....	\$3 ton	Free
Glycerine, crude, not purified.....	1c. lb.	17½ %
Talc, ground or bolted, not for toilet.....	35 %	Free
Sulphurate of soda or salt cake.....	\$1 ton	\$1 ton
Soda ash.....	¼c. lb.	¼c. lb.
Carbon electrodes.....	30 %	30 %
Brass in bars and rods, in coil, &c.....	45 %	10 % or free
Cream separators and parts of.....	45 %	Free
Tin plates, &c.....	1.2c. lb. or va- rious	5 %
Crucible cast steel wire.....	35 %	35 %
Galvanized iron or steel wire.....	1.2c. lb. or not less than	.....
Typecasting and typesetting ma- chines.....	35 %	Free
Barbed fencing wire.....	30 %	20 %
Coke.....	¼c. lb.	Free
Roller round wire rods, iron or steel, valued at 4c. or less per pound.....	20 %	20 %
Valued at over 4c. per pound.....	3-10c. per lb.	3-10c. per lb.
	6-10c. per lb.	6-10c. per lb.

### Mineral or Metal Products at Reduced Duties.

Articles, the growth, product or manufacture of the United States, to be admitted in Canada at the undermentioned rates of duty when imported from the United States, and reciprocally the same articles the growth, product or manufacture of Canada, to be admitted into the United States at identical rates of duty when imported from Canada:

	United States rates.	Can- adian rates.	Recip- rocal rates.
Clocks, watches, time recorders, clock and watch keys, clock cases and clock movements.....	40 %	Average 30 %	27½ %
Plateglass, not beveled, in sheets.....	22½c.sq.ft.	27½ %	17½ %
Autos and motor vehicles, except for railroads or tramways.....	45 %	35 %	30 %
Automobiles and motor vehicle parts of (excluding tires).....	Do.	Do.	Do.
Digesters for pulp mills.....	Do.	30 %	27½ %
Portable engines and traction engines.....	30 %	20 %	20 %
Parts of, for repair.....	45 %	17½ %	15 %
Horse powers for farm use.....	30 %	30 %	20 %
Hay loaders.....	45 %	25 %	20 %
Potato diggers.....	45 %	25 %	20 %
Fodder or feed cutters.....	45 %	25 %	20 %
Grain crushers.....	45 %	25 %	20 %
Fanning mills.....	45 %	25 %	20 %
Hay tenders.....	45 %	25 %	20 %
Farm or field rollers (and road rollers).....	45 %	25 %	20 %
Manure spreaders.....	45 %	20 %	20 %
Windmills.....	45 %	20 %	20 %
Parts for repair.....	45 %	20 %	20 %
Grindstones, not mounted, 30 in. or more in diameter.....	\$1.75 ton	15 %	5c. cwt.
Flagstone, granite, rough sandstone and all building stone not ham- mered, sawn or chiseled.....	.....	.....	.....
Roofing slates.....	10c. cu. ft.	10c. cu. ft.	12½ %
Vitrified paving blocks.....	20 %	{ 75c. 55c. 100sq.ft. 100sq.ft.	.....
Paving block or stone.....	35 %	22½ %	17½ %
Oxide of iron.....	10c. cu. ft.	20 %	20 %
Asbestos, woven fabrics of.....	30 %	22½ %	22½ %
Asbestos, other manufactures of.....	40 %	25 %	25 %
Pocket knives and penknives worth not over 40c. dozen.....	40 %	30 %	27½ %
Worth over 40c. but not over 50c. doz.	{ 1c. ea. + 60 %	1c. ea. + 40 %	1c. ea. + 40 %
Worth over 50c. but not over \$1.25	{ 5c. ea. + 40 %	5c. ea. + 40 %	5c. ea. + 40 %
dozen.....	.....	.....	.....

A small list of articles is given special rates by each

country. Canada reduces the rate on coal to 45 cents per ton and cement to 11 cents per 100 lb. The United States reduces iron ore to 10 cents per ton and lowers the rate on aluminum products.

It is understood that, because of the time and labor expended in maturing the agreement and the benefit expected to result to the people on both sides of the border, it would remain in operation for a considerable period, but neither the United States nor Canada is to be prevented from making any changes in its tariff policy that might be desirable in the future. The utmost care is to be taken by both governments to see that only such customs regulations are adopted as are reasonably necessary to prevent fraud, and that none should be made unreasonably to hamper the more liberal exchange of commodities. Any further legislation necessary to accomplish this is to be sought by both sides.

It is stipulated that the legislation on either side may contain a proviso that the agreement shall not become effective as to rates until actual action on the subject in that direction is assured.

## The American Society for Testing Materials

Announcement is made concerning the letter ballot on the manner of the organization of technical committees of the American Society for Testing Materials. The proposal that the chairman of such committees should be selected from representatives of consuming interests and unattached experts was carried by a vote of 180 to 67. The minority favored no restriction on this matter, so that producers as well as consumers and unattached experts might be eligible to committee chairmanships.

There has been some sentiment in favor of holding the annual meeting of the society at a farther western point, but it was decided not to change this year, and the annual meeting will therefore be held at Atlantic City in the last week of June, 1911. As far as possible papers and committee reports will be printed in advance of the meeting. One of the features of the programme already scheduled is a symposium on hardness tests.

Preparations will soon be started for the Sixth Congress of the International Association for Testing Materials which will be held in New York in 1912. A nucleus for the Committee on Organization has been constituted in the Executive Committee of the American Society and the officers of its standing committees. They will hold their first meeting in New York in February. The American membership in the International Association is now 450, out of a total membership in the American Society of 1325. It is expected that the American representation will be very considerably increased before next year.

## The Quebec Bridge

Disagreement between the members of the Quebec Bridge Board having arisen over the design of the bridge, George P. Graham, Canadian Minister of Railways, has appointed H. W. Hodge of New York and M. J. Butler, general manager of the Dominion Steel Company, to adjust the differences. The Quebec Bridge Board consists of H. E. Vautelet of Montreal, chairman; Ralph Modjeski of Chicago, and Charles MacDonald, formerly of New York, but a Canadian by birth. Tenders were submitted by several companies, including the British Empire Bridge Company of England, which bid upon the Government's design for the bridge. Mr. Vautelet is understood to approve this bid and to recommend its acceptance. The St. Lawrence Bridge Company, a merger of several big Canadian companies, has exercised its privilege of submitting a design of its own. It is understood that Mr. Modjeski and Mr. MacDonald favor this bid. Under the order in council governing the bridge policy, experts are to be retained to pass on such differences.

The total cost of the wrecked bridge was disclosed in Parliament, January 30, by Minister Graham, in response to questions. The cost of the wreck to date is \$7,154,987.49, but the Minister estimates that the value of unused steel on hand is \$300,000.

# The Expansion of Fayette R. Plumb, Inc.

## A New Plant Completed at St. Louis

The business of Fayette R. Plumb, Inc., manufacturer of small tools, at Philadelphia, Pa., is to be greatly enlarged by the new plant just completed at St. Louis, Mo. The causes which led up to the construction of much larger works in the West than the factory at Philadelphia are well told by the company as follows:

"Every dealer who specializes in tools has seen the growth of the demand for 'something better.' Recogni-

of many thousands of dollars. This has been done at our Philadelphia plant.

"The result has been apparent in our line. The improvement has brought the demand we expected. We are giving our customers a line of tools on which they can talk and prove quality. Their business has increased so much that, in spite of our not soliciting new accounts and the general refusal of new business, our business has ex-

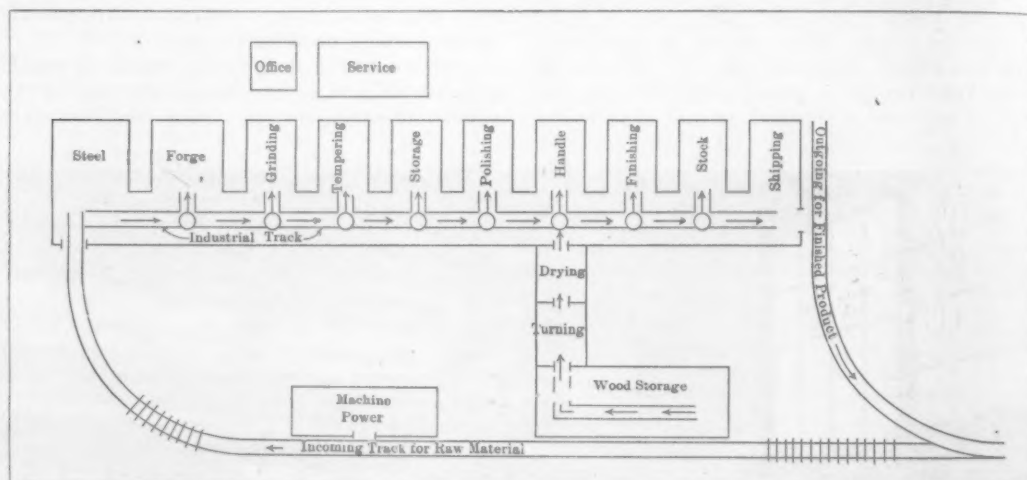


Fig. 1.—Ground Plan of the St. Louis Works of Fayette R. Plumb, Inc.

nizing this insistent demand, we adopted some years ago the motto, 'They're worth more,' and bent all our energies toward making the motto true.

"The first step was a revolution in our Philadelphia plant. We realized that to get tools uniformly good more scientific methods must be employed. The old rules of thumb and haphazard methods must be done away with. In the old way we could make good tools, but we weren't sure. Too much was dependent on the skill of the individual workmen. When the tools were not good, many

panded beyond our power to take care of it at our Philadelphia plant. On account of this fact, the greatest fault our customers have found has been our failure to ship orders with reasonable promptness. We realized the importance of prompt shipments, and consequently decided to build an additional plant.

### Why St. Louis Was Selected for the Location of a New Plant

"The first thought, of course, would be to build an extension to our Philadelphia plant. We realized, however, our opportunity. Prompt shipment was only half the battle. Quick delivery was necessary. The great hardware jobbing centers of the United States are in the Central West. From our Philadelphia plant we can ship to advantage for export trade to New England and to all points that can be reached from either the Atlantic or the Pacific coasts. By building our new plant in the Central West we have the advantage of quick deliveries and low freight rates in this important territory. Thus from St. Louis we can make quick deliveries to the heart of the country, while at Philadelphia we sit at the doorway into the Southeast and New England and command the water ports for our export trade or the Pacific Coast.

"Next in consideration to advantages in delivery is ease or saving in the purchase of raw materials. The raw material which is the most difficult for us to secure is high-grade hickory for our handles, and

here St. Louis has a great advantage over any more northern point. Hickory has to be bought under widely differing conditions in numerous small lots. The man on the ground is able to save thousands of dollars every year on a volume of purchases

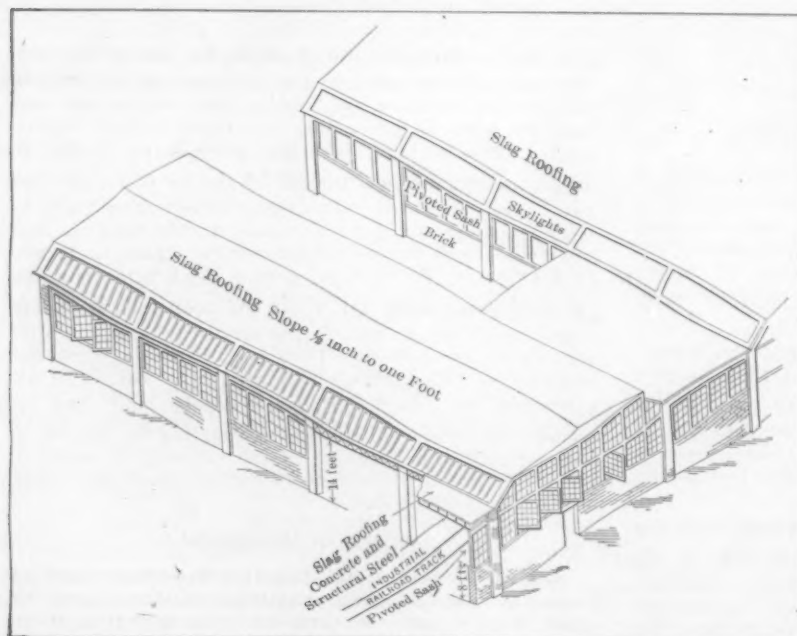


Fig. 2.—Design of Buildings for the Separate Departments.

were bound to get through, and there was the constant temptation to let them go rather than swallow the loss. The development of new methods and the adoption of new machinery meant the work of years and the spending



such as ours and get a higher grade of material. Steel, of course, is our chief raw material, but the freight rate is the only advantage location can give in the purchase of that. We found also, as regards other supplies, such as coal and fuel oil, St. Louis was advantageously located. Our investigations showed us, therefore, that for our industry St. Louis was well located to secure raw material.

More important, however, than any question of raw material is that of the labor condition. At the St. Louis suburb of Wellston we found the ideal combination of a small community with the facilities of a large city. The five car lines converging within a short distance of our plant enable us to draw either from the adjacent rural communities or the city. The plant itself is in an open space free to light and cooling breezes and surrounded by moderate priced ground where our employees can build and own their own homes. We want men of good character, health and ability, whom we can train in our own methods. We therefore get a permanent force who will settle around us and take a personal interest in us as we

#### For the Comfort of the Employees

All main departments are not only heated in winter with fresh air, but in summer are supplied with cool air from a central 210-in. steel plate exhauster. The fresh air in winter is forced over four row miter type heaters, and through underground ducts to each department where it distributes itself from large radiators 8 ft. above the floor level. The pressure of the air is such that when windows are opened the air will be rushing out doors rather than in doors. As the temperature of the air can be controlled to whatever degree of heat is desired, it keeps a constant temperature in all departments. Unpleasant drafts are also kept from the workmen, on account of the windows being above their heads and the tendency of fresh air to go out through them, carrying with it smoke or impure air. Each department is equipped with necessary toilet facilities and a drinking fountain.

The service building is the center of population. It is so placed as to be the shortest distance for the greatest number of employees from their respective departments.



Fig. 3.—View in the Interior of the Long Connecting Building, with Stations for Inspectors at the End of Each Department Building.

in them. This it is almost impossible to secure in the congested centers of a city with its floating population."

#### Description of the St. Louis Works.

The accompanying illustrations show some features of the new plant. In Fig. 1 the layout of the buildings is presented. Instead of erecting a very large single building, housing the entire force of operatives, the scheme was adopted of dividing the work into a number of departments, each of which is placed in a building by itself. The design of the department buildings is shown in Fig. 2. An open space of 30 ft. is provided between each department building and the one nearest to it, for the purpose of securing an abundance of light and air. A building running the entire length of the plant connects all department buildings at one end, and enables close inspection to be made of the entire output. A view down the interior of this connecting building is given in Fig. 4.

The windows are placed 8 ft. above the floor levels and run to the roofs in order to obtain full advantage of the natural light. They are placed in tiers and are pivoted vertically so that they can be opened in both summer and winter to allow smoke and air to blow out without subjecting workmen to drafts. Above the windows skylights are placed. The shape of the buildings also adds materially to the lighting. The interior of all buildings except the office is lined with white tile. The ceilings are white washed and the floors are of granitoid concrete. In addition to this, all piping, shafting, &c., are below the floor level so that there is nothing to throw shadows within the rooms. The result is practically perfect natural light.

It is for the exclusive use of employees, and is provided with steel lockers, benches, and all necessary toilet facilities, so that workmen can change their clothes and prepare for work before going into their various departments. This building prevents space being wasted in the manufacturing departments for the use of lockers and washbasins. It saves the company considerable time, as every employee changes his clothes in this building, and from there goes to the department in which he is employed. He rings "in" on a time clock after entering the department ready for work. At noon each workman rings "Out," and returns to the service building for dinner, where arrangements have been made to serve hot luncheon to all employees at a moderate cost. The departments are closed during the dinner hour, and reopened only a few minutes before starting for the afternoon, when the programme of the morning is repeated. This gives the men complete recreation from their work in the middle of the day.

#### Efficiency in Management

Next in importance to attracting the proper class of employees is the adoption of methods of management by which the most efficient work can be secured from them. The very design of the buildings in this plant goes far to solve this problem. Every employee is under the eye of either the foreman in his department or of the chief inspector in the long inspecting department. There is an inspector for each operation, who is obliged to examine every tool immediately after it leaves the department for which he is responsible. Any tool which is not perfect is at once rejected and returned.

From the polishing room onward a modification of the Taylor system of shop management is used. All tools, after being polished, are placed on movable tables, tagged with cards upon which is clearly printed all information concerning the finish, packing, labeling, &c., which they are to receive before shipment. This insures every tool against errors occurring in following departments.

#### Improved Manufacturing Methods

After everything possible has been done to secure the best class of employees and to make it a natural thing for them to put forth their best efforts, it is still necessary to furnish them with machinery worthy of their skill. The company states that the manufacturing methods have been developed to meet these requirements. In the forging operation, for example, the foreman does not rely upon the taste or skill of the individual employee, but holds him to standards which the machinery makes it natural for him to follow. The design of each particular tool is laid out by the engineering department in consultation with not only the sales department, but wherever possible, after study of the "points" looked for by the individual mechanics. From this design a model is prepared, and from this model sets of expensive dies are made; these are what the workman uses in his forging machine, and by the method that he follows every detail must absolutely conform to these dies and consequently be like the original model. These practices differ widely from the method formerly used where the workman simply followed certain dimensions and the lines depended more or less upon his individual skill and taste.

The same principle of substituting the accuracy of standards for individual skill has been followed in the tempering operation, conducted in the department shown in Fig. 4. The effect of both the hardening and drawing operation in tempering is secured by quenching the steel suddenly at known temperatures. In the old method these temperatures were left to be judged by the eye of the workman who frequently attained a surprising skill. The scientific method, however, and the one pursued by this company, is with the use of pyrometers and thermometers, by which the temperatures can be determined exactly.

Wood billets from which handles are made are stored in a special building designed for them. This building is so arranged that the billets are constantly free to natural outdoor air drying without being exposed to the weather, as shown in Fig. 5. After being turned into handles, they are stored in another room which dries them further—not by hot air, but by warm changing air. Through this method is obtained the result of air drying, which does not injure the original strength of the wood, instead of forcing the drying kiln at a high temperature.

#### How Economy in Manufacturing Is Secured

Efficiency in a plant, however, includes not only the ability to turn out the product just as it is wanted, but has a second very important factor—namely, economy in manufacturing. It has already been shown how the arrangement of the plant makes supervision of labor easy and the saving in time effected by having all the employees ring up in the departments after they are ready for work. A further saving is effected by the arrangement of the buildings through which the cost of handling the product is reduced to a minimum.

To illustrate this, observe that the plant is composed of 16 buildings. Thirteen of them are devoted directly to manufacturing purposes. The other three are an office and chemical laboratory building, a service building, and a power house and machine shop. The buildings devoted directly to manufacturing purposes represent the various departments through which the material passes during the process of manufacture. The raw material is brought in by rail and unloaded by cranes in the steel storage building. Thence it goes successively to the forging department, the grinding room, the tempering room and to the intermediate storage. The tools are then polished and go to the handle department. Joined to the handle department is a wing composed of three buildings, each separated by a fire wall, where wood is stored and made up into handles. At this point in the manufacturing process the steel product meets the wood product and the two are assembled. A fire wall separates the polishing department from the handle department and the finishing department from the stock department.

After the steel tools are fitted with handles they go to the finishing department, where they are labeled, wrapped and boxed, then to the storeroom, and from it to the shipping department, where they are loaded on cars. Each one of these departments is the building adjoining the preceding operation and connected to it by the long inspection department. The product, therefore, passes in a steady stream without winding or check straight in its way from the raw material to the shipping car.

The power used for all machinery in the plant is electric. Wasted power is prevented by the use of individual motors for the machinery in the forging department and the machine shop, where it is often desirable to run only one heavy machine at a time without using power for the whole department. In the other departments, such as grinding, polishing, &c., the machinery is run by groups, so that but one line of machinery can be run at a time if desired. Where the machinery is run by groups all shafting is supported by roller bearings. This reduces shafting friction to a minimum and affords a considerable saving of power.



Fig. 4.—Heat Treatment or Tempering Department.



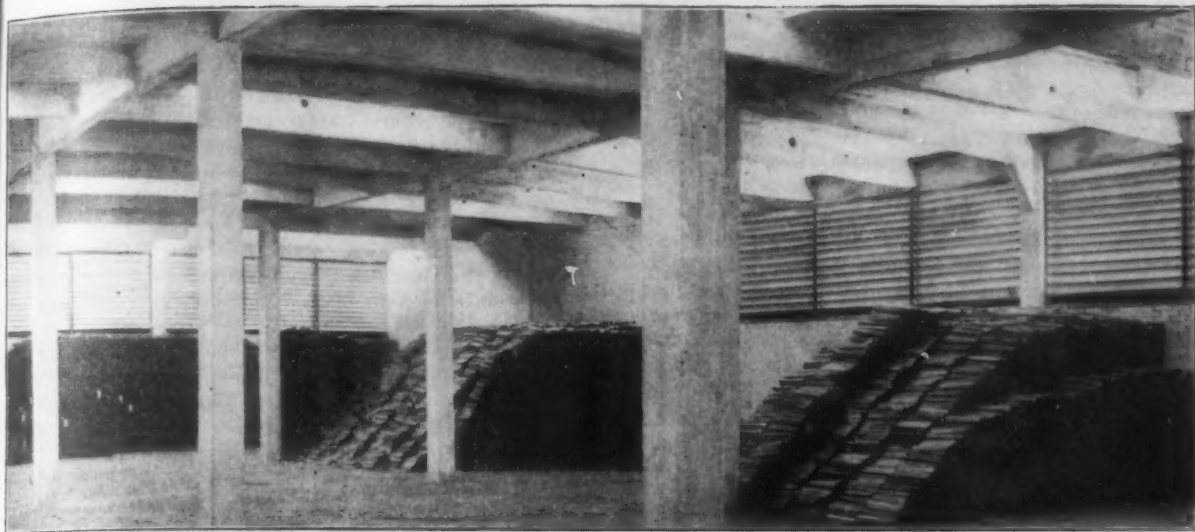


Fig. 5.—Wood Storage Building, Where Hickory Is Seasoned Before Being Made Into Handles.

### Other Special Features

All shafting is laid in concrete pits underground. This not only permits better natural light on account of the absence of the heavy shadows resulting from overhead shafting, but enables the shafting to be easy of access in case of needed repairs. Being covered over with all pulleys and belting practically out of reach, it also considerably reduces any danger of accidents. The only visible equipment in all departments consists of the actual machines themselves, as the piping and wiring are also laid beneath the floor. Besides the fact that such belting as is used is protected from dirt and grit, the quantity needed is reduced to a minimum, there being less than \$400 worth of belting used in the entire plant.

The prevention of fire has been carefully borne in mind. The buildings vary somewhat in design, each being particularly adapted to that branch of the industry for which it is used. The walls of all buildings are of brick. The roofs are of steel with roof trusses covered with either concrete or slow burning material. Departments in which wood is used are separated by fire walls and are protected by a sprinkler system, so as to reduce fire damage to a minimum. The design of all the buildings is such that one of the leading manufacturers' mutual insurance companies quoted a net rate of only 5 cents per \$100.

### What the Plant Will Make

While the St. Louis factory will make a line of high-grade hammers, hatchets, &c., such as are made in the Philadelphia plant, a line of chopping axes has been added. In doing this, the company states, that it fully realizes the conditions governing the axe business and that the capacity of the present plants is well able to take care of the volume required. On this point it says: "We believe, however, there is a demand for an axe that is 'worth more.' Our plant will enter the field equipped only with the latest and most improved machinery and designed in every part to use effectively the improved scientific, accurately correct methods learned from our experiences in remodeling our Philadelphia plant. We do not intend simply to add to the present volume of axes made, but to make something different. Our aim shall be to supply the demand for 'something better.'"

### The Chandler & Farquhar Company's Expansion.

The Chandler & Farquhar Company, machine tools and machinists' supplies, 34-38 Federal street, Boston, Mass., states that the increase in the volume of its business has necessitated larger stock room. A commodious and well arranged machine tool store has therefore been opened at 419-425 Atlantic avenue, where a display is made of new feature machine tools in actual operation. The supply department at 34-38 Federal street has been renovated and rearranged with the addition of new sections of compact and up-to-date equipment. W. A. Dow and Martin D. Farnum, for many years identified with

the sales department, have been admitted to membership in the corporation. The company has again booked for an extensive showing of machine tool equipment in operation at the National Motor Boat Show, Boston Automobile Show and Boston Chamber of Commerce Exposition. The supply department has also engaged a desirable corner space at the New England Hardware Dealers' Exposition.

### Cammell Laird & Co. of New York

Cammell Laird & Co., Ltd., ranking among the three greatest steel workers and shipbuilders in Great Britain, have formed an American company to handle their products in this country. This new American corporation is known as Cammell Laird & Co. of New York, and its main office and warehouse are in the four-story building just completed at 34 Cliff street, New York City. It will occupy the entire building, and will carry a larger stock than ever of English tool and high speed steel. It will be one of the most modern and best equipped steel warehouses in the United States.

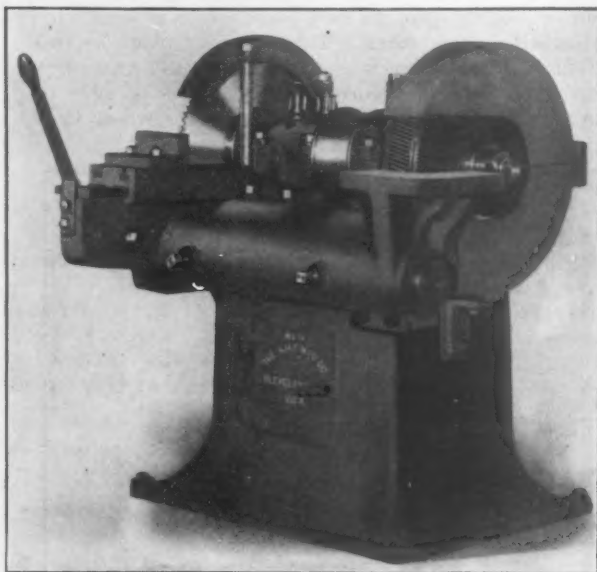
Cammell Laird & Co. were among the first experimenters in and developers of high speed tool steel, and special attention to this class of the business will be given by their American company. Among their other great specialties are nickel and chrome nickel steel for automobile parts and heavy forgings for ships, rolling mills, sugar mills, &c.

One of the managers of Cammell Laird & Co. of New York is Lionel Samuel, who has been the general agent of the English company and established its offices here some years ago. Under his energetic direction the business has so outgrown its old quarters at 25 Cliff street that the organization of a new company and the quadrupling of warehouse and office facilities became necessary. Mr. Samuel is not only well known in New York, but also in Mexico and in Central and South American countries, with many of whose governments he has had large business relations. He is the secretary, manager and a director in the new company. The president is Leonard Munn of Sheffield, England. The treasurer is Alexander Muir, who was the Canadian manager of the English company. The new corporation will represent not only Cammell Laird & Co., Ltd., of Sheffield, but all its allied interests, such as the Cyclops Steel & Iron Works, Yorkshire Steel & Iron Works, Grimesthorpe Ordnance, Steel Tyre & Spring Works and Shipbuilding Works at Birkenhead.

The third semiannual meeting of the American Institute of Chemical Engineers will be held in Chicago, June 21 to 24. Arrangements will be made to visit a number of the large plants in the vicinity. The committees on Chemical Engineering Education and Standardization of Boiler Tests will have important reports to present. The programme of papers will be announced later.

## The Ajax Hot Saw and Burring Machine

A desire to bring about further economy in the production of machine made forgings has prompted the Ajax Mfg. Company, Cleveland, Ohio, to develop and place on the market an addition to its line of forge shop equipment. This new machine is a hot saw and burring machine that has been primarily designed for use in connection with an upsetting forging machine for all sizes of forgings that can be easily handled without using a crane. The material is heated, placed in a forging machine and formed, after which the headed forging is cut from the bar by the hot saw, thus leaving a clean square end. The burrs or fins that are formed



A New Hot Saw and Burring Machine Built by the Ajax Mfg. Company, Cleveland, Ohio.

after a set of dies have been used can be readily removed without reheating.

In general design the machine is similar to a double ended grinding or emery wheel stand. The shaft is journaled in two bearings with the belt pulley located between them, and outside of these bearings at either end are the saw and the burring head. The latter which is at the right end is fitted with a milled band and a milled disk face, which are made of a special grade of steel. The burring table is adjustable and can be tilted to any angle by loosening the clamping bolts that hold it to the stationary shaft secured in the front housings. The saw table at the opposite end is fitted on the under side with a rack meshing with a pinion which is operated by the hand lever shown at the left of the engraving. There is a rigid shield over both the saw and the burring head to protect the operator from flying pieces of steel.

The machine is built with a heavy base and large bearings to withstand the high speed at which it is operated. The main bearings have ring oilers. Three sizes of machine are built with saws and burring heads 14, 20 and 30 in. in diameter. The floor space occupied by all sizes is the same, 3 x 4 ft.

## The Quaker City Foundry Supply Exhibit

Annually between Christmas and New Year's Day the J. W. Paxson Company, Philadelphia, Pa., gives an exhibition of foundry equipment and supplies, presenting the new articles that have been introduced during the year. Expert molders and craftsmen are employed who show each machine at work. These men are able to demonstrate in detail the "how and wherefore."

At the recent exhibition about 300 foundrymen (iron, steel and brass) availed themselves of this opportunity to keep in line with such new labor-saving machinery as the new Whitehead flask bar tucker, to tuck the sand under and on both sides of the bars at the same time.

This is done while in a standing position and saves the molder from bending over and injuring the ends of his fingers. Another simple device was demonstrated to stop the run outs in foundry flasks. It enables the operator to force a bunch of wet sand where it is wanted to stop the escaping metal. A complete Paxson-Warren sand blast outfit with the latest improved sand blast tumbling barrel and air compressor, also tramrail, hoists, and small capacity overhead cranes, &c., were in evidence. The new Buch hand and foot power jar ramming molding machine makes the cope and drag, turns them over and draws the pattern in a jiffy. This is for bench work and small castings. The new Barker rock-over molding machine for air, with vibrator attachment, also came out the past year. This machine turns over the flask, rams it and draws the pattern automatically. The Paxson-Colliat cupola, under construction, with the new side inlets to take the blast pipe more readily, and the new idea of ironing foundry ladles were also noticed.

The new ocean towing barge, Lottie, that carries 900 tons of molding sand, is an addition to the fleet of Paxson's line of 19 tugs, boats and steam barges. New machinery and improved methods were seen in the facing mills, pattern shop, blacksmith and machine shops; also in the wire and bristle brush and bellows factory. The Paxson Company believes in an early start, and now extends an invitation to visit its 1911 exhibition at headquarters.

## Coke Oven Gas in Open Hearth Furnaces

A recent issue of *Stahl und Eisen* has a short article on the subject given above. The experience at Hubertushuette with the use of coke oven gas in open hearth furnaces has already been reported by Dr. Petersen; and the results of further experiments at the same plant were given at the International Congress at Düsseldorf by Chief Engineer Terplitz, as reported in *The Iron Age* of July 14, 1910, page 103.

At the Cockerill plant in Belgium work has been done on a small 4-ton furnace, in opposition to the large furnaces at Hubertushuette. After some change in the ports this small furnace has been run since last July entirely on coke oven gas. The air alone is heated in regenerators. The best run of the furnace has been 300 heats. The gas consumption, with a daily production of 16 tons, amounts to 15,360 cu. ft. per ton of steel. The gas is furnished by a battery of 108 Solvay by-product ovens, the output of which is 450 to 500 tons of coke per 24 hours. The average analysis of the producer and coke oven gases is as follows:

	Producer gas. Per cent.	Coke oven gas. Per cent.
CO <sub>2</sub> .....	7.5	1.5
CO .....	19.3	6.0
CH <sub>4</sub> .....	1.3	22.5
H .....	12.3	57.0
N .....	59.6	13.0

The additions made to the steel and the composition of the finished steel remained the same with coke oven gas as before. A careful comparison was made to determine whether it is more scientific to use coke oven gas to heat open hearth furnaces or to use it in gas engines. The advantage was with the former method by 20 per cent.

The highest value now obtainable in the gas engine under Belgian conditions is 29.3 cents per cubic meter, while in the case of the open hearth furnace the amount is 36.7 cents.

The Cockerill plant is also experimenting with coke oven gas in heating furnaces, and hopes to be able soon to do away with the use of coal. Blast furnace gas has not been found to have enough fuel value for open hearth furnace use; but this may be rectified by an admixture of either heavy hydrocarbons or coke oven gas.

G. B. W.

The Baird Machinery Company, Pittsburgh, Pa., dealer in machine tools and machinists' supplies, has opened a branch office in Masonic Temple Building, Erie, Pa., in charge of F. J. McCoy.



## The Newark Gear Pattern Cutter

### A Universal Machine Operating at Constant Speed for Cutting the Teeth of Wood Gears

Spiral and helical gears are now cast solid from patterns made in wood. These wooden patterns are exact models of the finished gears, and to produce them rapidly and economically the Newark Gear Cutting Machine Company, Newark, N. J., has brought out a new gear cutting machine. Fig. 1 is a view of the operating side of the cutter, while Fig. 2 shows the driving side. It will be noticed from these engravings that the general construction of the machine resembles that of a regular gear cutter operating upon metal blanks. There are, however, several points of difference between the two due to the nature of material to be cut in both cases, the principal ones being the feed and the indexing mechanisms.

helical gears. A very large range of pitches can be cut on this machine, and when fly cutters are used all pitches ranging from 1 to 7 in. circular can be cut, while it is also possible to cut heavier pitches easily. Where teeth of fine pitches have to be cut this can be done by employing regular rotary gear cutters. The types of cutters for heavy pitches are clearly illustrated in the engravings. In Fig. 1 a formed fly cutter is shown mounted upon the spindle for cutting spur gear patterns. An end mill type of fly cutter mounted on an end mill attachment is used for cutting helical gears or worms, as shown in Fig. 2. In this case the cutter is operating at a speed of 4200 rev. per min.; while for spur gears the speed is 1000 rev. per min. less.

The wooden pattern blank is mounted upon the work arbor or directly upon the face plate, which is solid with the dividing worm wheel. This wheel is made in two sections, and the worm is generated after the wheel has been put in place to secure accuracy. It is possible to take the dividing worm out of mesh with the wheel, thus

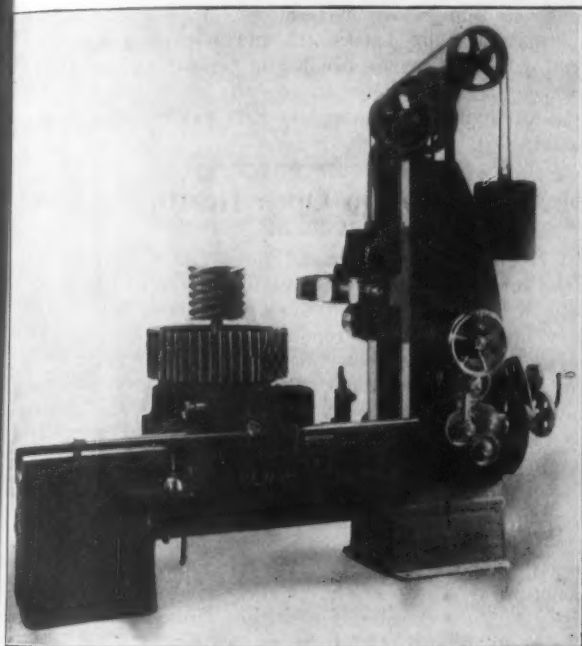


Fig. 1—The Operating Side.

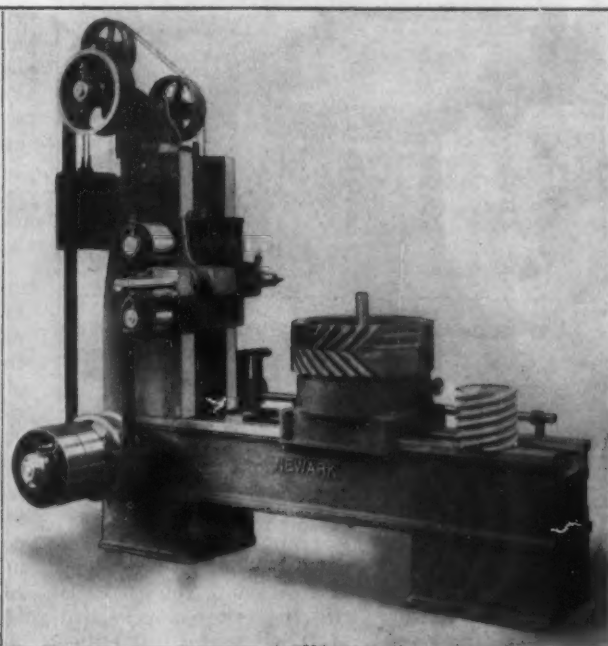


Fig. 2.—The Driving Side.

Two Views of a Cutter for Making Wooden Gear Patterns Built by the Newark Gear Cutting Machine Company, Newark, N. J.

A hand wheel operating a screw with ball thrust collars actuates the feed mechanism. Hand feed is used in preference to the automatic power feed of the standard gear cutter, so that the rate can be varied as desired. During full cut it is possible to feed very fast, but at other times, such as when the grain of the wood changes or the cutter strikes a knot or when they come through at the end of the cut, it is desirable to feed more slowly. The cutter carriage which has a counterbalance to equalize its weight is returned to start a new cut as each tooth is finished and the blank is indexed by a hand crank. The indexing is accomplished by change gears, which avoids the use of dials and the possibility of spoiling work through mistakes in their use, and the operator makes one or more even turns of the crank according to the index furnished. Like the automatic gear cutter of this company which was illustrated in *The Iron Age* December 29, 1910, all numbers of teeth up to 100 can be cut, and all except prime numbers from 100 to 450. The machine is so arranged that if any unusual number is required to be cut it can be done by employing an extra change gear, although this is seldom necessary, as a wide range of higher numbers can also be cut. The capacity of the machine for spur gear patterns is 8 ft. in diameter and 24 in. face width, while for helical or spiral gear patterns the diameter is 1 ft. less, while the face width remains the same. It is possible to cut a worm having any lead or any desired number of threads, as well as any desired lead for

allowing the blank to be rotated by hand, and the worm also has an attachment for use in resetting blanks or in taking side cuts. Protection from dirt and dust are afforded to both the worm and the worm wheel by a guard completely surrounding them. For taking the thrust of the cut when working on large gear patterns a rim support is provided. A screw with a dial graduated to read in thousandths of an inch furnishes the necessary adjustment for the work head on the bed. In addition to cutter patterns for gear blanks, blocks of wood for use in gear teeth molding machines can also be cut.

While this machine is designed for cutting wood the metal is distributed as though it were intended for use with metal blanks. The bed is deep and of the box type, a feature which eliminates the tendency to vibration generally found in machines of this character. It is also very rapid in operation, a 40-tooth spur gear pattern of 8-in. face width and a circular pitch of 3 in. being cut in 30 minutes actual cutting time.

Another noticeable feature of this gear cutter is the simple drive with an endless belt, that is clearly shown in Fig. 2. An arrangement of tight and loose pulleys running on a rigid sleeve and not on the shaft drives the machine itself. This relieves the shaft of all strain due to belt pull and at the same time the possibility of accidental starting. As the machine runs at a constant speed, motor drive can readily be applied without the use of a countershaft.

## The Richardson Mechanical Lubricator

### A New Device for Lubricating Engine Cylinders

Friction between the piston rings and the internal walls of the cylinder of an engine is responsible for the greater part of the power lost in a steam engine. As can be shown by the use of indicator cards, this loss amounts to anywhere from 3 to 20 per cent. While some of this loss occurs in the bearings the bulk of it is due to the cylinder friction. Although bearing lubrication is amply provided for in the majority of engines the question of cylinder lubrication is not generally so well taken care of. In fact, one of the most difficult problems that a power



Fig. 1.—The Richardson Model M Lubricator Made by the Richardson-Phenix Company, Milwaukee, Wis.

plant engineer has to solve is the proper lubrication of steam cylinders.

In an effort to solve this problem the Richardson lubricator was designed, and the latest type of this device, which is manufactured by the Richardson-Phenix Company, Milwaukee, Wis., is shown in Fig. 1. Fig. 2 shows one of the lubricators applied to a Corliss engine, while Fig. 3 is a section of the lubricator showing the details of its construction, and Fig. 4 illustrates the application of one of these lubricators to a tandem Corliss engine. Although this lubricator has been on the market in its original form for some time, in its most improved form it has a number of new features, such as the circulating channel over the top of the device and a special excess feed valve that allows an extra supply of oil to be fed into the various lines without deranging the adjust-

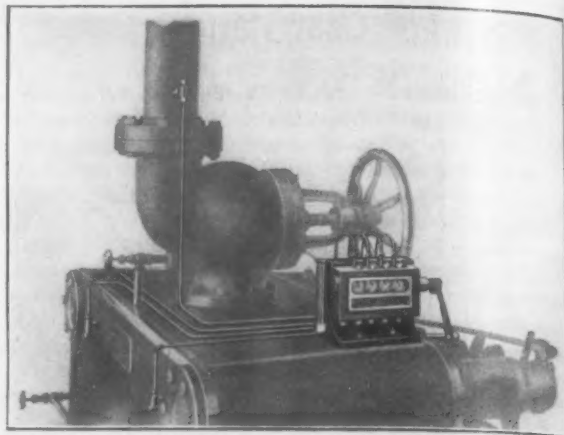


Fig. 2.—A Four-Feed Richardson Lubricator Applied to a Corliss Engine.

In the ordinary methods of cylinder lubrication the oil is fed by a hydrostatic lubricator or else by one of the force feed type, both of which mix the oil at stated intervals with the entering steam. These lubricators are said to be faulty in one respect, however, as they do not provide economical lubrication for every stroke of the engine. If, for example, four drops of oil are to be fed per minute to the steam entering the cylinder and the speed of the engine is 200 rev. per min., each large drop of oil will be broken up and atomized with the steam, but at the same time a large portion of it will pass out with the exhaust without having effected any lubrication. During the following 100 unlubricated strokes the entering steam will remove whatever portion of this large drop was deposited on the cylinder walls, and when the next drop is fed they are so dry that it is difficult for the oil to emulsify and cling to them.

In the Richardson lubricator some oil is fed at every stroke of the engine, and an oil cup plunger is used for each feed line. This plunger moves up and down in unison with the strokes of the engine and cuts off a small particle of oil and forces it into the cylinder at each revolution regardless of the rate at which the oil is being fed through the sight feed nozzle.

The design and operation of this lubricator will be un-

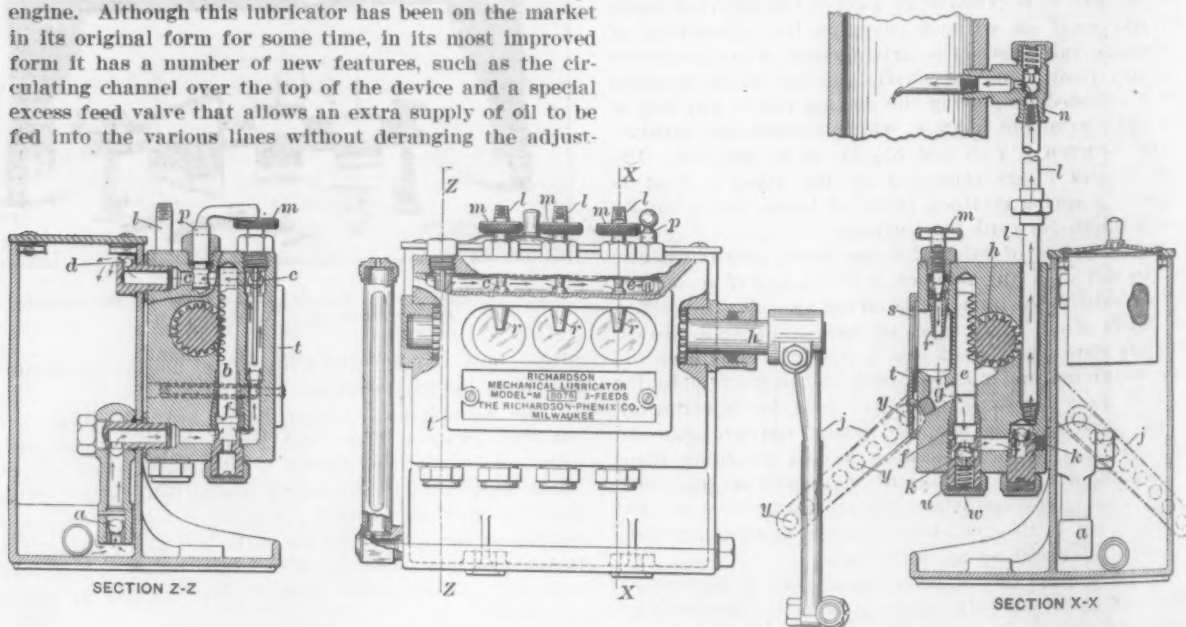


Fig. 3.—Constructional Details of a Three-Feed Lubricator.

ment of the individual drips. The use of this circulating channel makes it possible to place a quantity of flaked or powdered graphite in the oil reservoir, and the continuous circulation of the oil through the body of the lubricator keeps the graphite churned up so that it remains in suspension and is carried by the oil to the various parts to be lubricated.

derstood by referring to Fig. 3, in which the travel of the oil from the main reservoir to the outlet feeds is indicated by arrows. The lubricant is withdrawn from the reservoir through the foot valve *a* by the plunger *b* and delivered to the circulating channel *c*. The needle valves *m*, which regulate the flow of oil through the drip nozzles *r*, are connected to this channel. The surplus lubricant



which does not flow through the feed valves is returned to the reservoir through the overflow ball check valve *d*. There is a slight constant gravity head on each drip nozzle which causes the oil to flow drop by drop at any desired rate into the chamber *g*. A common gear shaft, *h*, which derives its motion from the driving lever actuates the individual feed line plungers *e*, which move up and down with every revolution of the engine. At each downward stroke a small particle of oil lying in the chamber *g* is cut off and forced out through the check valves *k k* into the feed line *l*. These feed lines are always full of oil as far as the check valve *n*, which is located at the point of delivery. In this way every time the pump plungers come down they force a small particle

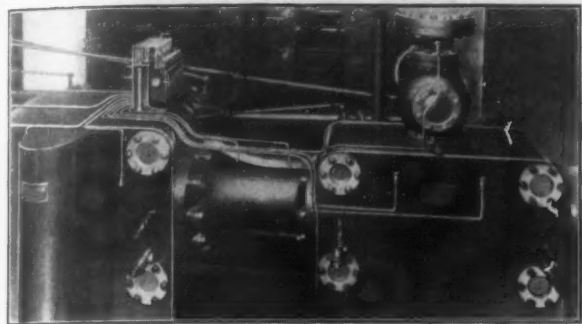


Fig. 4.—A Tandem Corliss Engine Equipped with an Eight-Feed Lubricator.

of oil into the feed line, and a corresponding amount is liberated at the terminal check valve. Using these two check valves, which are of a special steel ball type held in place on a bronze seat by a coiled spring bearing against the plate *u*, under the hexagonal nut *u*, prevents the steam from backing up into the lubricator.

A special feature of the lubricator is the increased feed valve *p*, located in the oil circulating channel *c*. Normally this valve is open, but if it becomes necessary to increase the amount of lubricant fed temporarily it is closed. This shuts off the overflow return to the reservoir and causes all the oil delivered by the plungers to flow through the feed nozzles, thus temporarily forcing the flow of all the feeds. After the demand for increased lubrication has been met, the valve *p* is opened. In this way it is possible to meet a temporary demand for additional oil without changing the adjustment of the needle valves *m*. The driving lever *j* can be moved into any position on the shaft, and the travel required for it adjusted by placing the driving rod in any one of the eight wrist pin holes *y*, which permits any straight travel between 3 7-16 and 8 1/2 in. to be secured. The feed nozzles *r* are protected by the glass *s*, kept in place by a spring retained frame of brass, which can be easily tipped forward for cleaning.

Several sizes of lubricator are made, and the device can be had with any number of feeds, and if so desired with a subdivided tank for handling two or three different kinds of oil. Two types of these multi-feed lubricators are shown in Figs. 2 and 4, a four-feed type in the first engraving and an eight-feed in the latter. In the first of these the extra feeds are used for injecting oil under valve seats or metallic piston rod packing. In one special type of lubricator having 22 feeds three kinds of oil are fed. This ability to handle several kinds of oil is an advantage where the lubricator is to be used to supply oil to the cylinders of steam engines, air compressors, refrigerating machines, &c.

An interesting test of the efficiency of the Richardson lubricator was recently made at the Lardner's Point pumping station, Philadelphia, Pa. At the time this test was made 12 engines were in operation. Six of these, the first to be installed, had the ordinary type of force feed lubricator, while the others added later were lubricated by the Richardson device. To determine the relative merits of both types of lubricators, one of the original units was tested for oil consumption for two months. During the first month its regular equipment was used and for the latter half of the test a Richardson lubricator was employed. The results of these two tests showed

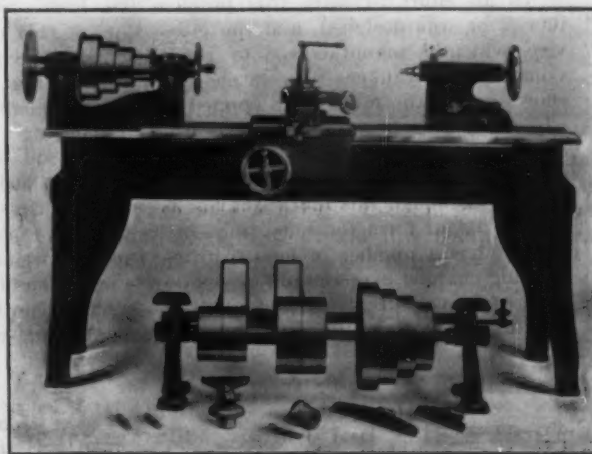
that the substitution of the Richardson lubricator reduced the oil consumption about one-third, and at the same time the efficiency of the engine was increased. Five tandem compound engines aggregating 3000 hp. and operating 24 hours a day were installed at the plant of the Alpha Portland Cement Company. With the old type of lubricator about 600 gal. of medium grade cylinder oil was used per month, but when the Richardson lubricator was substituted the amount of oil was reduced approximately 40 per cent.

### The Robbins Patternmakers' Lathe

Recently the Robbins Machine Company, Worcester, Mass., has redesigned its 16-in. patternmakers' lathe. The changes made have resulted in the production of a tool embodying all practical points of convenience in its construction, and that is powerful and rigid throughout.

Crucible steel is used for the headstock spindle, which extends through to the outer end of the headstock. The spindle runs in dustproof, ring oiling phosphor bronze bearings having large reservoirs for lubricant, and a large face plate for turning work having a greater diameter than the swing over the ways is mounted on the outer end of the spindle. The headstock is also swiveled at the base and has graduated plates for turning tapers on face plate work. The tailstock is of the ordinary cutaway and setover design, and the crucible steel spindle has a long travel.

The carriage is rigidly constructed and gibbed to the bed with hand lateral feed for the entire length of the lathe. If desired, power lateral feed can be furnished at a slight additional cost. The compound tool rest has a graduated swivel which can be adjusted on the cross slide of the carriage by a screw having a coarse pitch. Adjusting screws with long travel, and the usual tool posts are furnished, and the compound rest can be quick-



A New 16-In. Patternmakers' Lathe Built by the Robbins Machine Company, Worcester, Mass.

ly detached and replaced with swivel holders supporting tool rests for hand turning.

The countershaft hanger boxes are self-oiling, and the two pairs of tight and loose pulleys of different diameters enable two speeds to be secured, this change being controlled by the maker's special belt shifter, which requires only one handle to operate both belts. The equipment furnished with the lathe includes tripod rests, three hand tool rests, one pair each of wood and pointed centers, two face plates, a screw plate and the necessary wrenches.

A bill introduced recently in the Michigan Legislature provides a specific tax of 1/2 cent per pound on copper and 15 cents per ton on iron ore produced in the State of Michigan, in addition to regular taxes already levied. The bill is backed by the State Grange, powerful in southern Michigan politics. The fight for the governorship last fall centered largely around this question, and in his canvass for votes Governor Osborne stated plainly that he was opposed to such a measure.

# Power Requirements of Electric Furnaces

## Results with the Frick Type in Reducing Iron Ore and in Refining Steel—Heroult Furnace Pig Iron

At the meeting of the Chicago Section of the American Electrochemical Society at Chicago, January 20, a paper was read by James Lyman, Chicago district engineer of the General Electric Company, on "The Electric Furnace for the Manufacture of Iron and Steel." It covered comprehensively the various types of electric furnaces which have become commercially successful and gave data on results of operations with each type. Much of this ground has been covered in articles heretofore published in *The Iron Age*, therefore the lantern slide views which accompanied the reading of the paper are omitted. Extracts are made below, however, from the portion of the paper dealing generally with the subject and that describing the Frick electric furnace, concerning which less has been published than of other types. Some data are also included of the performance of the Heroult furnace in the reduction of iron ore:

### Advantages of the Electric Furnace

Highly skilled chemists, mechanical and electrical engineers have wonderfully improved and increased the output of our iron and steel mills in recent years. They have probably developed the present processes to very nearly their limit of perfection. They are, however, certain inherent characteristics of these processes that prevent obtaining the very highest qualities of iron and steel. For instance, these processes depend upon various fuels as the source of heat, and during the treatment for the elimination of harmful ingredients, certain foreign impurities, such as nitrogen and oxidation products, enter the bath injuring in a measure the desired qualities of the metal. Further, there is not always a perfect homogeneity and soundness of metal throughout the entire charge, and either the chemical analysis of different charges or the physical properties of these charges, or both, may differ perceptibly.

Many metals, including iron and steel, are refined by melting them in contact with a slag composed of ingredients which will absorb their impurities. For the most effective action the slag must be fluid only at the highest temperatures. The electric furnace is capable of creating the highest known temperatures, much higher than any temperatures of combustion, and therefore producing the greatest fluidity of flux and metal, and this without introducing air or fuel; but, on the contrary, maintaining a perfectly neutral atmosphere above the metal and slag. While the high fluidity of metal and slag conduce to the most rapid, uniform and chemically perfect action on the part of the absorbing flux, no oxidizing products, nitrogen or other impurities of combustion can enter the metal, and the whole operation can be continued as long as the operator desires introducing or removing any ingredients and in exact percentages.

Furthermore, irons and steels of specifications which have been obtained with difficulty or never have been obtained in any of the standard processes are readily obtained in the electric furnace. For instance, nickel steel, which Mr. Schwab is quoted as stating will be the steel for rails in the future, can be made directly without difficulty in the electric furnace. The superior control of the electric furnace over all furnaces depending in their action on heat of combustion especially commends its use in the refining of high grade irons and steels.

### Heat Costs Compared

The extent to which the electric furnace will be generally introduced depends on the cost of operating the electric furnaces and the superiority of the product, as compared with that of the combustion furnaces. The cost of electric heat obviously depends upon the cost of power from water or other sources, as compared to the cost of fuel at the locality under discussion. Further,

electric energy may be supplied from water power or from blast furnace gas at a cost, when the efficiency of the electric furnace is considered, which compares very favorably with the cost of high grade fuels, as charcoal and producer gas.

Professor Richards pointed out in his excellent paper on "Electric Furnace Reduction of Iron Ore," presented at Niagara Falls in 1909, that the amount of fuel used in a blast furnace is determined by the amount which must be burned at the tuyeres to produce the necessary smelting temperature, and not by the amount necessary to perform the reduction of the metallic oxides. The amount necessary for performing the reduction taking place in the furnace is only one-third to one-half of the amount necessary to burn to provide smelting heat, and he is confident that any practical method of introducing electrical heat into the crucible of a blast furnace will result in large economies in furnace working. Only one-quarter of the heating power of the fuel is developed around the blast tuyeres, and yet if half of this could be replaced by electrically generated heat, an economy of 50 per cent. could in all probability be reached upon the fuel bill. It takes 1.2 tons of coke to make a ton of pig iron in the blast furnace and about  $\frac{3}{4}$  ton is burnt by the blast producing the melting zone, about 25 per cent. of the calorific power of the coke. If one-half this smelting heat, or  $12\frac{1}{2}$  per cent. of the actual heat of combustion, could be supplied by electric energy, the coke required could be reduced one-half, or 0.6 ton, per ton of pig iron. The quality of the pig iron would also undoubtedly be greatly improved and it is probable the output would be increased.

### The Frick Arc Furnace

Arc furnaces are so called because the heat is developed in an arc established between two large carbon or graphite electrodes, or between these electrodes through the slag and metal bath. The induction furnace is so called because the melted metal forms a single turn closed circuited secondary of a large transformer. The arc furnace is adapted to both the reduction of iron ore to pig iron, and also to the refining of pig iron and steel. The induction furnace is only adapted to the refining of metals, and cannot be used for the reduction of ore.

The Frick electric reduction arc furnace for smelting iron ore has shown a capacity approximately 25 tons of pig iron per 24 hours; the current taken is 2000 kw., or approximately 1 kw.-hour per pound of pig iron produced. Where the iron ore used is of not less than 57 per cent. F., the theoretical power required for the reduction of the iron in the presence of carbon and unslacked lime is from 1200 to 1350 kw.-hours per ton, exclusive of the heat absorbed by the slag. This heat is from 100 to 300 kw.-hours per ton of the pig iron, making a total of from 1300 to 1650 kw.-hours per ton, provided burnt limestone is used. The radiation losses occur partly through the walls, partly through the electrodes. In the case from which data have been obtained the radiation losses are said to be from 320 to 370 kw.-hours. The electrical efficiency of this furnace is therefore approximately 80 per cent. Smaller furnaces have larger radiation losses and lower efficiency.

### The Frick Induction Furnace

The Frick induction type furnace for refining iron and steel has the following construction: A ring shaped crucible of uniform cross section holds the melted metal, forming the secondary winding of the transformer. A magnetic core built of laminated iron forms a closed magnetic circuit around the coils. Two primary coils of insulated copper ribbon are mounted, one above and one below the crucible, on the magnetic core. These coils may be wound for any desired voltage up to, say,



6000 volts. A furnace built by Mr. Frick for Fried. Krupp, A. G., in Essen, Germany, in January, 1910, has been in successful operation since, refining approximately 20 tons of steel per day from cold scrap in three charges of about 6½ tons each, with six and one-half hours' duration of charge. The power required is approximately 1 kw.-hour for 3 lb. of steel refined, or 665 kw.-hour per ton. To obtain a reasonably high power factor a special low frequency alternating current of from 5 to 15 cycles is used. An engine driven generator designed to furnish this low frequency single phase current is employed. The electrical power supplied is controlled by regulating the generator voltage. The electric efficiency of this furnace is said to be about 65 per cent.

The power consumed in melting the material (cold iron and slag) to, say, 1500 degrees C., in a 10-ton furnace, is approximately 600 kw.-hours per ton, or 0.3 kw.-hour per pound. The power consumed for refining the steel after melting is from 1800 to 2000 kw.-hours for a 10-ton charge, or approximately 0.1 kw.-hour per pound. Therefore, only where cheap power is available can the electric furnace be commercially used to melt cold material. The melting down can be effected more economically in the open hearth or other combustion furnace.

#### Thermal Efficiency

It is estimated that in a well designed 15-ton 2000-kw. induction furnace the total thermal efficiency from coal or gas would be approximately as follows:

	Per cent.
Gas engines, say.....	20
Electric generator, say.....	94
Electric furnace, say.....	80
Total efficiency.....	15

If steam turbine generators are used at, say, one-half the cost for fixed charges over the gas engine installation, and, say, 15 per cent. efficiency from the coal or blast furnace gas, the total thermal efficiency of the electric furnace would be about 11 per cent.

The efficiency of an open hearth furnace is said to be from 20 to 25 per cent. In this case the fixed charges and maintenance of the gas producers partly offset the turbines or gas engines. It is therefore apparent that the cost of refining melted pig iron or steel in the electric furnace, while considerably greater than by the open hearth, is not excessive.

#### The Heroult Furnace for Pig Iron

The most notable installation of the Heroult arc furnace for the reduction of iron ore to pig iron is that of the Noble Electric Steel Company, at Heroult, Cal. In 1907 the first large furnace was built, taking 1500 kw. of power, but not proving entirely successful, this furnace was replaced with a smaller experimental furnace of 100-kw. capacity. From the experience obtained with this furnace a second large furnace was built early in 1909, which has been in almost continuous service, making 25 tons of pig iron per day of a quality comparable with the best Swedish kind. Four more furnaces of the same size are now being built, which will make this the largest plant of the kind in the world.

A very pure magnetite ore of 70 per cent. F. and a high grade limestone are quarried near by. The company makes its own charcoal and purchases hydroelectric power from the Northern California Power Company. Three 750-kw. oil insulated, water cooled, 60-cycle transformers are wound for 2200 volt primary and a secondary range of 35 to 75 volts. The secondary current varies from 10,000 to 21,400 amperes. The range in voltage is controlled by a dial switch in the primary circuit of each transformer, giving steps of about three volts in the secondary. The generation of energy in the furnace is, therefore, controlled externally without movement of the electrodes, whose position is changed only to accommodate their wear in the crucible of the furnace. There are six electrodes, two for each transformer. While the primaries of the transformer are connected to the three-phase power line, the secondaries are not interconnected.

#### High Grade Steel Products

The demand for strictly high grade steel absolutely homogeneous and with fine grain is to-day coming from the railroads for steel rails and structural bridge steel.

from the Government for armament, from the automobile industry, from every manufacturer of tools and machinery, engines, steam turbines, electrical manufacturers, and, indeed, every manufacturer using iron or steel. The treatment of Bessemer and open hearth steel in the electric furnaces at an increased cost entirely within the limits of the purchaser will make this steel comparable in its fineness with crucible steel, and have the physical characteristics best adapted to the particular application desired. Since the railroads have investigated the causes of rail breakage it has been proved that many of them were due to the presence of foreign injurious bodies, such as slag and manganese sulphide. The possible presence of these impurities as well as the products of oxidation and nitrogen is inherent in the Bessemer and open hearth furnaces, but can be almost entirely eliminated by a treatment of an hour or two in the electric furnace.

Rails from electric furnace steel are now being tried out on curves, railroad crossings and points where the service is most severe by a number of the large railroad systems. These rails combine unusual tensile strength, toughness and hardness. Their life alone, aside from their increased reliability, will probably justify the increased cost.

To bring the enormous output of steel rails, structural, merchant and plate steel up to the high grade of crucible will mean a new era for the steel business, and rapid advances in all lines of manufacture employing iron and steel.

#### Electric Steel Castings and Forgings

The manufacture of modern and light weight steel castings has always been a difficult and unsatisfactory problem. There is a large wastage particularly in castings of odd shapes. This is principally due to impurities and sluggishness of the flow of metal in castings. With less than one-third the electric power necessary for purification, the liquid metal can be held indefinitely in an electric furnace without any loss in its composition or danger of burning, and a highly liquid metal can be cast uniformly free from impurities and gases. Such steel castings can in a large measure replace steel forgings at present used at a much reduced price. While the large steel companies will, no doubt, introduce electric furnaces as a refining process for their principal output, the electric furnace can probably be used to advantage by manufacturers of all kinds of iron and steel products in making special high grade steels from their waste scrap iron and steel, including borings and turnings, as it accumulates in process of manufacture. These furnaces will either be entirely electric or the metal may be brought to melting point by gas or coke fuel and then treated by electric heat.

**Iron Ore Receipts at Lake Michigan Ports.**—The receipts of iron ore at Lake Michigan ports in 1911, as reported by the *Marine Review*, are as follows:

South Chicago, Ill.....	5,080,879
Gary, Ind.....	1,775,880
Indiana Harbor, Ind.....	287,172
Milwaukee, Wis.....	121,446
Elk Rapids, Mich.....	60,857
East Jordan, Mich.....	37,910
Fruitport, Mich.....	37,785
Boyer City, Mich.....	50,355
Total.....	7,452,084

The developments on the south and southeast shores of Lake Michigan, as represented particularly at Gary and South Chicago, have brought up the total materially so that 1910 has made a new record.

A joint convention of the Southern Supply and Machinery Dealers' Association, the National Supply and Machinery Dealers' Association and the American Supply and Machinery Manufacturers' Association will be held at Louisville, Ky., April 3, 4 and 5. The convention headquarters will be at the Hotel Seelbach. As it is very unlikely, however, that the Seelbach will be able to accommodate all the members of the three associations, arrangements have been made with the Galt House and the Louisville Hotel to take care of any who can not secure rooms at headquarters.

## Large Sizes of Lap Welded Pipe

### A Recent Extension to the Line of the American Spiral Pipe Works

Until recently the largest size of lap welded which it was possible to obtain was 30 in. in diameter. At the present time the American Spiral Pipe Works, Chicago, Ill., is manufacturing lap welded pipe ranging in diameter from 12 to 72 in. from open hearth flange steel having a tensile strength of 55,000 to 65,000 lb. This pipe is used for high pressure hydraulic lines, condenser piping and compressed air work as well as other places where severe duty is required. Fig. 1 shows some sections of the 30-in. pipe, 32 ft. long, which have a perfectly smooth interior wall. Figs. 2 and 3 illustrate two lengths of pipe, one 24 in. and the other 20 in. internal diameter, after undergoing tests to rupture the welded joint. Fig. 4 is a view of an 11-ft. lap welded steel drum

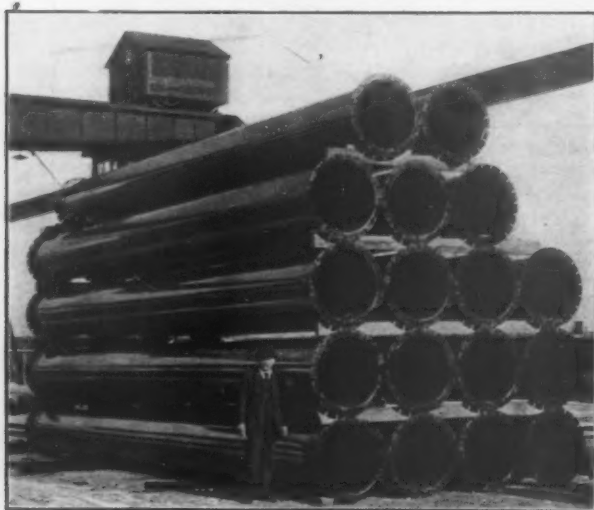


Fig. 1.—Some 30-In. Lap Welded Dredging Pipe, 32 Ft. Long. Made by the American Spiral Pipe Works, Chicago, Ill.

and serves to give some idea of the capacity of the maker's plant.

After the pipe has been welded, it is heated for a second time in a large annealing furnace and thoroughly annealed to remove any strains which may have been produced during the welding process. Test bars cut from the welded seam show the remarkable strength possessed by the weld, and in many tests the joint developed a tensile strength in excess of 60,000 lb. per sq. in. The results of a series of physical tests made by Robert W. Hunt & Co., on some of the welded joints are given in the following table:

Specimen number.....	1	2	3	4	5
Remarks .....	Welded	Welded	Welded	Welded	Unwelded
Original length, in....	1.49	1.497	1.504	1.51	1.503
Original width, in....	0.255	0.245	0.252	0.242	0.249
Length after fracture, in. ....	1.15	1.38	1.152	1.18	1.13
Width after fracture, in. ....	0.145	0.182	0.145	0.145	0.152
Original area, sq. in. ....	0.38	0.3668	0.379	0.3654	0.3742
Fractured area, sq. in. ....	0.1667	0.2512	0.167	0.1711	0.1718
Actual elastic limit, lb. ....	17,610	17,000	20,110	15,530	16,810
Actual maximum load, lb. ....	23,760	22,400	24,150	20,500	22,590
Elongation in 8 in., in. ....	1.03	0.44	0.88	0.92	1.18
Elastic limit per sq. in., lb. ....	46,340	46,350	53,060	42,500	44,920
Tensile strength per sq. in., lb. ....	62,520	61,070	63,720	56,100	60,370
Elongation in 8 in., per cent. ....	12.88	5.50	11.00	11.5	14.75
Reduction of area, per cent. ....	56.13	27.66	55.93	53.18	54.09

The four welded specimens all broke outside of the weld except the second, which broke across the joint. Specimens 1 and 5 were both taken from the same pipe, No. 1 being at the weld and No. 5 some distance away.



Fig. 2.—A Section of 24-In. Pipe After Undergoing a Fatigue Test.

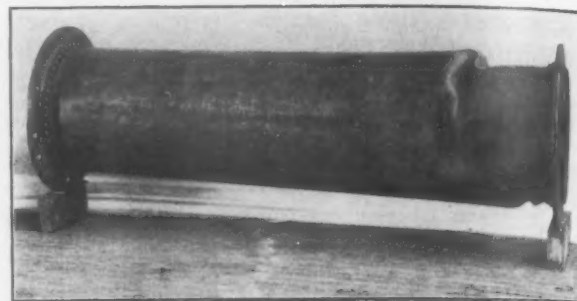


Fig. 3.—A 20-In. Pipe After Being Subjected to 565,000 Lb. Pressure in an Unsuccessful Effort to Open the Seam.

It is not claimed by the maker that the seam is stronger than the material from which the pipe is made, but at the same time the character of the weld is said to be such that it will average close to the maximum strength of the plate.

Fig. 2 shows a length of 24-in. internal diameter pipe with a wall  $\frac{1}{4}$  in. thick, which was tested for fatigue to see if the weld would weaken under repeated strains. In making this test the pressure was raised to between 900 and 1100 lb. nine different times without the pipe showing any signs of fracture, although the diameter increased  $1\frac{1}{4}$  in. and the metal stretched approximately 4 in. as is clearly shown in the engraving. On the tenth test a small fracture occurred near the weld. As the internal diameter of the pipe was then

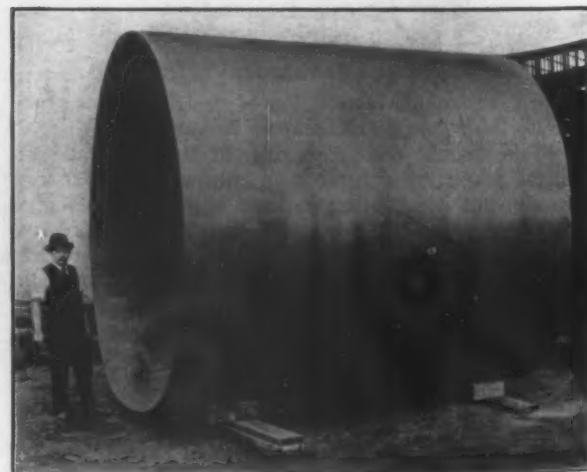


Fig. 4.—An 11-Ft. Lap Welded Steel Drum.

25 $\frac{1}{4}$  in., the strain to which it was subjected was in excess of 55,000 lb. per sq. in.

In Fig. 3 a length of 20-in. internal diameter pipe with walls  $\frac{1}{4}$  in. in thickness is shown after being subjected to a total end pressure of 565,000 lb. in a hydraulic press in an effort to rupture the welded seam. Although as the engraving shows the seam was badly folded, when tested under water pressure no sign of fracture was apparent.

The Russel Wheel & Foundry Company, Detroit, Mich., reports a very active demand for logging cars, a particularly heavy volume of business coming from the South. This company has recently added to its power plant, having installed a 250-hp. boiler and a 175-kw. generating unit. An addition has also been made to its blacksmith shop.



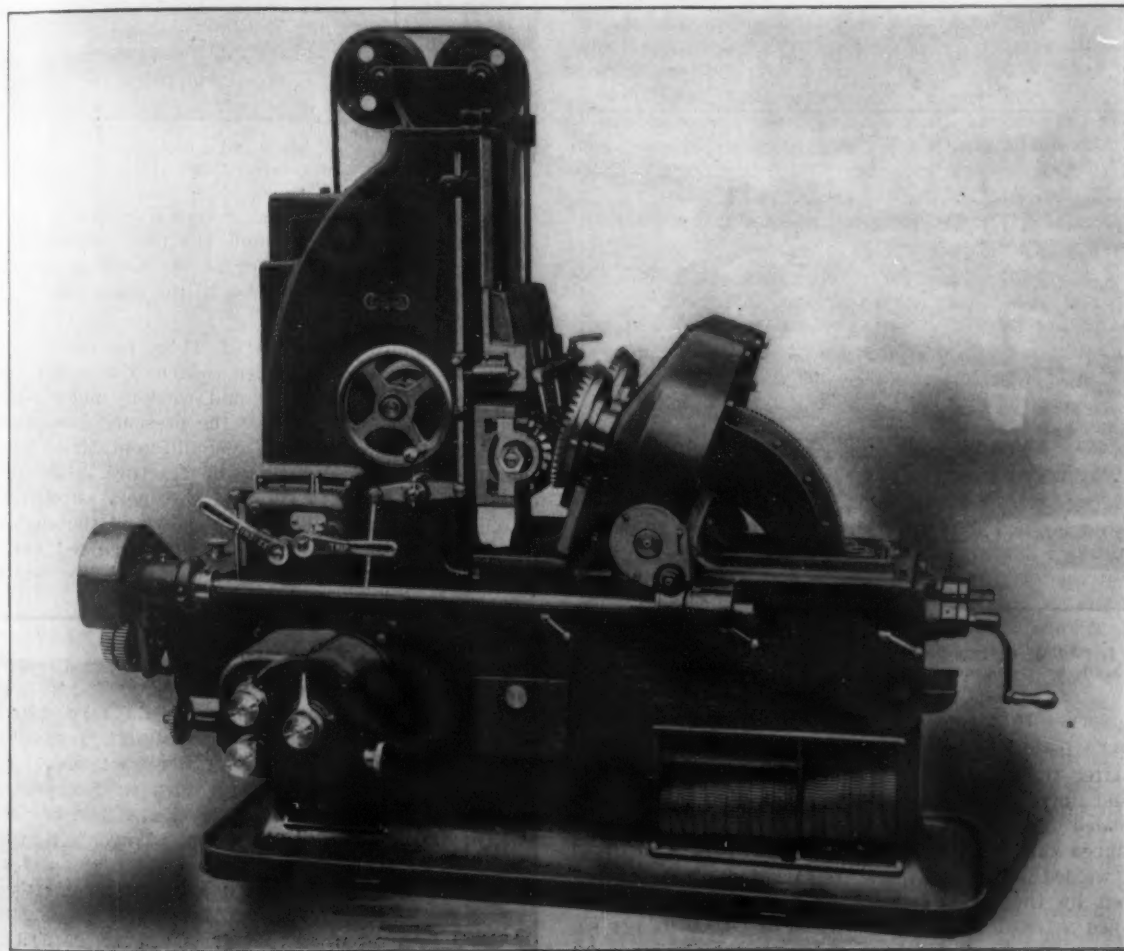
## New Gould & Eberhardt Gear Cutter

### A Multiple Spindle Automatic Vertical Machine Is the Latest Product

For roughing out bevel gears preparatory to finishing them on a bevel gear planer, Gould & Eberhardt, Newark, N. J., have designed and are manufacturing a new gear cutter. This machine which represents one of the latest developments in the art of gear cutting machinery is of the multiple spindle automatic vertical type, and is a manufacturing tool capable of cutting from one to three bevel or spur gears or worm wheels or clutches simultaneously, a feature which materially reduces the time per piece. The machine has sufficient capacity to handle

jected to excessive stress. The feeding and indexing mechanism of the cutter are driven very directly, ball bearings being used where necessary to take care of the thrust. At the present time patents are pending on the arrangement controlling the feed, return and indexing of the cutter slide. This mechanism is operated by two levers and enables the operator to return the cutter slide by power without unlocking the indexing mechanism. This feature is very useful in sizing a gear blank. A safety device that keeps the cutter slide from feeding until the indexing of the work is completed also forms a part of this mechanism.

The work slide has three spindles. All of the spindles are controlled by a positive mechanism which indexes them in unison by helical gears directly under the blanks being cut. Blanks of various diameters can be cut by



A New Multiple Spindle Automatic Gear Cutter Built by Gould & Eberhardt, Newark, N. J.

blanks 24 in. in diameter and 8 in. wide, and in the engraving is shown roughing out two steel driving gears having 49 teeth of 5 pitch and a face 1 5-16 in. wide.

With the exception of the special cutter and work slides this machine is substantially the same as the automatic vertical gear cutter which was illustrated in *The Iron Age* December 29, 1910. The cutter slide is arranged for one, two or three cutters and the bearing for the spindles is of such a type that each cutter has an individual support located close to it on either side. The extra number of cutters used and a corresponding increase in the amount of torsional stress to which the cutter arbor is subjected, as well as the extra duty required of it, led to the use of a bearing of this nature. The slide actuating mechanism operates on the draw-cut principle. Instead of anchoring the feed screw at the upper part of the stanchion and subjecting it to compression, it is anchored in the base of the stanchion, thus producing a tensile strain. This arrangement results in all the strains and impulses of the cutter being directly transmitted to the base of the machine and overcoming the vibration that is present when the feed screw is sub-

changing the number of spindles used. When all three spindles are employed the maximum diameter of blanks which can be accommodated is 5 1/2 in. Using the two outer spindles doubles the diameter of the blank, and if only the center one is used the capacity of the machine is a 24-in. blank. The regular segmental table support controlled by a worm and a worm wheel sector located in a central position under the table and securely held in place by an extra clamping device is used, and in addition there is a special adjustable brace supporting the periphery of each blank being cut. This brace supports the blank directly in back of the face of the bevel gears, and also acts as a chip chute to direct the used lubricant into the proper pocket in the base of the machine, where it is strained and the chips separated from it before it reaches the oil pump again. This combination of supports to the work table and the blank makes a rigid and solid construction that is essential in cutting a gear rapidly.

The weight of this machine is approximately 3500 lb., and it is equipped with guards that cover every running gear entirely.

## Labor Conditions in Iron Mining

### Contrasts Between Native and Foreign Born Workers of Lake Superior and the South

Conditions of living and employment in the iron mining districts of the country are set forth in an interesting and striking report of the Federal Immigration Commission, which will shortly be available for distribution. The operating forces in iron mining were studied by the commission on the Mesaba and Vermillion ranges of Minnesota and the Marquette, Menominee and Gogebic ranges of Michigan, as well as in the Birmingham district of Alabama.

Detailed information was secured for 8281 employees; and 255 households, the heads of which were employed in iron mines, were intensively studied. Of the total number of employees 52.6 per cent. were foreign born, while 4.3 per cent. were native born of foreign father, and 43.1 per cent. were native Americans, or native born of native father. The North Italians, Poles and Slavonians were the principal races of southern and eastern Europe engaged in the industry, while the Flemish, English and Swedes, of the races of Great Britain and Northern Europe, were represented in largest numbers.

Of the total number of foreign born employees only 8.5 per cent. had had any experience in iron mining before coming to this country, while 62.3 per cent. had been farmers or farm laborers while abroad. The average weekly wage of employees engaged in the industry was \$12.72; the average annual earnings of male heads of families, \$706, and of all males 18 years of age or over, \$682. The average annual income of families, the heads of which were employed in the industry, was \$990. Over one-half, or 55 per cent., of the total number of families studied derived their entire incomes from the earnings of husbands, while 31.6 per cent. were supported by the earnings of husbands and the payments of boarders or lodgers, and 4.8 per cent. by the earnings of husbands and the contributions of children. Only 18.2 per cent. of the households the heads of which were native born, as contrasted with 36.9 per cent. of those the heads of which were foreign born, kept boarders or lodgers.

The average number of persons per room in households the heads of which were native born was 0.97, and per sleeping room, 2.41, as against 1.71 persons per room and 3.47 persons per sleeping room in households the heads of which were immigrants. None of the native born households, as contrasted with 5.6 per cent. of the foreign born, used all their rooms for sleeping purposes. The greater degree of congestion in the latter class of households is shown in the average monthly rent payments per capita, that of the households whose heads were foreign born being \$1.09, and of the households whose heads were native born, \$1.38.

Of the total number of foreign born employees 91 per cent. were able to read and 89.8 per cent. were able both to read and write. Of the immigrant employees of non-English speaking races only 62.1 per cent. were able to speak the English language. Of the total number of employees 20 years of age or over 62.5 per cent. of the native born and 53 per cent. of the foreign born were married. Of the heads of families studied 19 per cent. of those native born owned their homes, as against 63.4 per cent. of those foreign born. Of the total number of foreign born employees 37.9 per cent. were fully naturalized and 22 per cent. had first papers. Only 1.2 per cent. of the foreign born males and 6.9 per cent. of the native born were affiliated with labor organizations.

#### The Mesaba and Vermillion Ranges

On the Minnesota ranges 218 households were studied and detailed information was obtained for about 2000 iron ore workers. The open pit methods of mining on the Mesaba range not requiring any skill or experience afforded ready employment to southern and eastern Europeans, and it was found that more than nine-tenths of

the operating forces were immigrants. The principal races employed in the Minnesota operations were, in the order of their numerical importance, Finns, Slovenians, Croatians, North and South Italians, Poles, Slovaks, Montenegrins, English, Americans and Swedes. Up to 1890 the necessary labor to develop the iron mining districts was drawn from the Michigan ranges and other sections of the United States. Since the early nineties a large proportion of the mine workers have come from abroad and Southern and Eastern Europeans have become the chief source of supply. The Vermillion range has well developed towns and is peopled with a permanent population. Representatives from all races employed own their own homes. On the other hand, the Mesaba district, although it has several cities of considerable size, is made up as a rule of more or less temporary mining communities, chiefly composed of Southern and Eastern European immigrants who have very little permanent interest in the country or the industry. The number of families is small as compared with the Vermillion district and the proportion of single men or married immigrants unaccompanied by their families is large. The prevailing living arrangement is that commonly known as the "boarding boss system," which usually consists of a boarding group occupying shacks and sharing equally the cost of living.

Of the immigrant iron ore workers on the Minnesota ranges only 7 per cent. had had any experience in mining before coming to the United States, while 75 per cent. had been farmers or farm laborers and unskilled laborers in their native countries. The average weekly earnings of native Americans were \$16.20 and of immigrants, \$14.12. About four-fifths of both nativity groups earned more than \$12.50 each week. The average annual earnings of native Americans who were heads of families were \$1024, and of foreign born heads of families, \$659. The average annual income of American families was \$1058, and of immigrant families, \$995. More than one-half of both classes of families were entirely supported by the earnings of the husbands. About one-fifth of the American families, however, depended also upon the earnings of children and two-fifths of the immigrant families supplemented the earnings of the head by keeping boarders and lodgers. The number of boarders in immigrant households averaged about eight persons, and in the cases of the households of some races was even higher. More than four-fifths of the Croatian households had boarders or lodgers. This practice, which was characteristic of Southern and Eastern Europeans, resulted in a high degree of congestion and in low standards of living. Medical service and accident and life insurance benefits are provided by the companies for the mine workers. About 10 per cent. of all the employees were illiterate and 50 per cent. were unmarried. Of the immigrant wage earners who were married more than two-fifths had left their wives and children abroad.

Of the native American families investigated only 19 per cent. as contrasted with 63 per cent. of the immigrant families owned their own homes. Excellent school facilities were provided in all communities, and because of the Minnesota compulsory school laws members of all immigrant races were found in the classes of the public schools. The greatest tendency toward naturalization was found among the Swedes and Finns. Members of these races take an active interest in politics, and come to the mining districts with the intention of establishing permanent homes. Of the total number of mine workers studied only 27 per cent. were fully naturalized and 17 per cent. had secured first papers. About seven-tenths of the total number of employees of non-English speaking races were able to speak English, although the proportion was much lower in the case of certain races, such as the North and South Italians and Montenegrins.

#### The Michigan Iron Ranges

The investigation on the Marquette, Menominee and Gogebic ranges in Michigan covered about 3000 iron ore workers. The principal races employed were, in the order mentioned, Finns, North Italians, Poles, Swedes, Croatians, English, Slovaks and Slovenians. Altogether

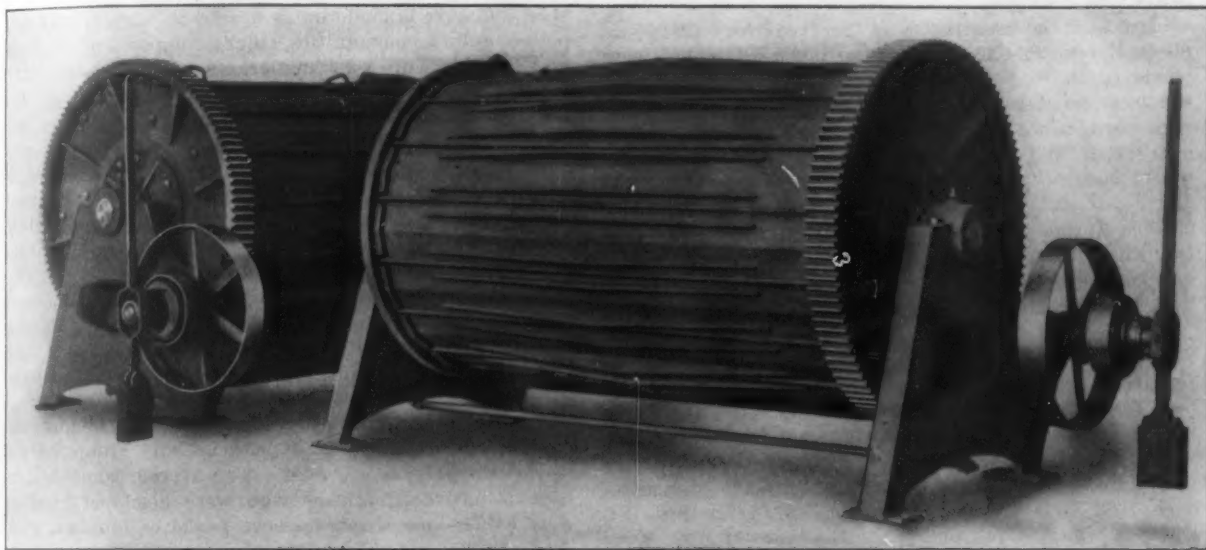


immigrants of 26 races were represented in the operating forces, and, as in Minnesota, about 90 per cent. of the operatives were of foreign birth. All the miners in the early days on the Michigan ranges were Americans, English and Irish. The French Canadians were first employed in the early seventies, and the Finns in the beginning of the decade 1880-1890. The immigrant employees from Southern and Eastern Europe have entered the mines during the past 25 years in response to the demand for labor growing out of the expansion of mining operations.

The greater part of the immigrant mine workers had been farmers or farm laborers abroad, and only about 10 per cent. had had any experience in mining before

## The Northern Tumbling Barrel

Two particularly noteworthy tumbling barrels were recently built by the Northern Engineering Works, Detroit, Mich. The special features of these barrels were their unusual size and the use of a friction clutch pulley. These barrels are of the maker's standard class B type in which a friction clutch pulley is employed for transmitting power from the overhead countershaft to the tumbling barrel shaft. The use of this clutch makes it possible to run these barrels singly or in batteries from one overhead shaft and still secure the positive drive from spur gearing, which is very desirable on such ma-



Two Northern Class B Tumbling Barrels with Friction Clutch Drive Made by the Northern Engineering Works, Detroit, Mich.

coming to the United States. The average weekly earnings of immigrant employees were \$14.24, and of native Americans, \$13.78. The favorable showing of the foreign as compared with the native born wage earners was largely due to the high range of earnings of the experienced English and Swedish miners.

The immigrant employees also showed a somewhat higher degree of literacy and a larger proportion married, as contrasted with those of the Minnesota iron ore mining districts. A greater tendency toward a normal family life was also evidenced by the fact that only about 30 per cent. of the male employees who were married reported their wives and families to be abroad. Only about one-half of the Polish and Slovenian miners, however, and less than one-half of the Croatians and North and South Italians were able to speak English. Forty-five per cent. of the foreign born mine workers were fully naturalized and 24 per cent. had signified their intention of becoming citizens.

### The Birmingham District

The study in the South was based on detailed information secured for 3500 employees in the Birmingham district of Alabama. The significant feature of the situation in the South was that only about 5 per cent. of the Southern employees, composed chiefly of North and South Italians, were of foreign birth, and that 67 per cent. of the operating forces were negroes. Slightly more than one-fourth were native white Americans. The earnings in the South were also considerably lower than in the other iron mining districts. The weekly earnings of the native white Americans were \$11.09; of the negroes, \$10.60, and of the immigrants, \$8.81. Illiteracy was much more marked in the South also, as compared with Minnesota and Michigan. Although 91 per cent. of the native white Americans could read and write, 42 per cent. of the negroes and 40 per cent. of the wage earners of foreign birth were illiterate. Two-fifths of the immigrant employees in the South could not speak English.

chines. In action they are said to be positive and stop and start without shock or sudden strain.

In the construction of these barrels hard cast angle staves secured by through bolts were used. These staves supported each other at the edges, thus giving a very strong construction. The bearings had a dust protecting casing and improved oiling attachments and were lined with babbitt metal. Renewable steel liners which can be replaced when worn out, thus saving the expense of a new barrel head, were used on the barrels. All the wearing parts were made exceptionally heavy on account of the extreme size of the barrels.

**A Labor Conviction Under the Sherman Anti-Trust Law.**—Organized labor felt the restraining force of the Sherman anti-trust law when a jury in the United States Circuit Court, at New Orleans, on January 25, returned a verdict of guilty against members of the New Orleans Dock and Cotton Council, charged with conspiracy to interfere with foreign commerce. The convicted men are James Byrnes, former president of the council and at present State Labor Commissioner of Louisiana; Philip Pearsaw, former president of the local Coal Wheelers' Union, and U. S. Swan, former president of the Longshoremen's Union. Swan and Pearsaw are negroes. The strike, which was begun two years ago, grew out of the refusal of the Coal Wheelers' Union to coal a steamer because nonunion longshoremen had been employed to load the vessel.

**New Standard Samples of Steel and Ore.**—The Bureau of Standards, Washington, D. C., is ready to supply the following new analyzed samples: No. 29, titaniferous magnetite ore, from New Jersey; No. 11a, basic open hearth steel with 0.2 per cent carbon; No. 12a, basic open hearth steel with 0.4 per cent. carbon. The steels replace the original samples which are exhausted. Renewal samples of Bessemer steels with 0.1 and 0.2 per cent. carbon are in process of analysis, also a nickel and a chrome vanadium steel.

SALESCHER & SONS.  
Mechanical and Civil Engineers,  
PITTSBURGH, PA.

## Electricity on a Plantation

On the eastern slope of the Allegheny Mountains in Virginia is located a tract of rolling upland consisting of about 11,000 acres owned by Thomas F. Ryan, the well-known American financier. The property is at Oak Ridge, Nelson County, on the Southern Railroad between Charlottesville and Lynchburg. Recently this large plantation was equipped with a complete electrical system for lighting all buildings on the place and to supply electric energy to drive the farm machinery, to operate the dairy, the flour and grist mill and to manufacture ice and do the other endless chores pertaining to farm work. Without this modern power system it would require a considerable number of men and horses to do the work about this large plantation. Now the working energy of 80 horses—of 500 men—is confined in one power room, where it can be instantly dispatched in any amount desired to do the hard work about the farm and the many farm buildings.

### The Power House

The main power house, located near the barn buildings, is of stone construction, with concrete floors, and is amply large enough to house the power generating machinery and the refrigerating apparatus and leave space enough for the milkrooms and the milk handling machinery. In the power room is a 60-kw., three-phase, 2300-volt General Electric generator, direct connected to a 100-hp., three cylinder Nash gas engine. The Nash engine operates on gas produced in the building from a gas producer plant utilizing anthracite pea coal. This gas driven generator supplies ample current for all the electricity used to light the many buildings on the plantation, gives energy to the many motors driving the farm machinery and provides for the operating of special heating devices, fan motors, &c. Compressed air is used for starting the gas engine, a 1-hp. motor operating the air compressor. Fastened to the ceiling in the power room is a small exciter, belted to the main shaft. To the left of the engine and generator are located the necessary switchboard panels. Three 10-kw. transformers are placed in the loft of the power house for stepping the voltage down to 220 volts for the motor circuits, with a 110-volt tap for lighting circuits. Standard marine wiring is used throughout and all wires are laid in conduit.

A portion of the power house building is devoted to refrigeration and the manufacture of artificial ice. A ton of ice is made every day, and in addition to this the plant maintains low temperatures in four cold storage rooms—one for meats, one for the perishable fruit products of the estate, another for milk and still another for milk products, such as cream and butter. A 15-hp. General Electric motor drives the ammonia gas compressor in this refrigerating plant, while a smaller motor, of 1½ hp. operates the brine circulating pump.

Another interesting installation in the power house is a 25-hp. low pressure boiler, which generates the steam used for heating the power house, supplies pressure to the small steam turbines which operate the cream separator and the bottle washer and gives a surplus supply of live steam for sterilizing the cans and bottles and the dairy machinery.

### The Dairy Arrangements

The dairy barn, which houses 60 imported Guernsey cows, is a model of its kind, with every convenience for caring for the stock and every sanitary arrangement necessary to preserve the health of the cattle and to assure a large supply of sanitary milk.

The milking is still being done by hand, although a vacuum milking system, driven by an electric motor, is being talked of. The milk is carried on an elevated cableway across the intervening space between the dairy barn and the power house building and deposited in the milk receiving vat located in the loft. The milk handling room is finished in white plaster with a concrete floor. A 3-hp. motor drives a countershaft from which are belted the pasteurizers, pump, &c. As the milk descends from the receiving loft by gravity it is strained and cooled. Part is then sterilized or pasteurized for ship-

ment and the remainder is put through a De Laval separator, driven by a tiny steam turbine, the cream being carried away to the ripening room, where it is cured and soured by a special process. In this apartment a 3-hp. motor drives the churn and other machinery.

In connection with the milkroom is a washroom where a 2-hp. motor drives a countershaft from which is belted a machine for washing cans. This machine washes the can inside and out in one process. A bottle washer is driven by a small steam turbine. Every can, bottle and pail, as well as the parts of the separator and other machinery, are thoroughly sterilized with live steam as soon as the washing is done. Live steam is also used to sterilize the floors and walls of the milkrooms after the rooms have been thoroughly washed and flushed. The dairy attendants are provided with a washroom, which is also equipped with suitable lockers and shower bath.

A novel feature of the dairy work is an up-to-date laundry where the white uniforms and other clothing of the dairymen are laundered. A 2-hp. motor drives the washing machine. Another motor, rated at ½ hp., whirls the centrifugal dryer and the mangle is operated by a ½ hp. motor. The drum of this mangle is heated by electricity. Electric flatirons are also used.

Besides the blooded cattle on the plantation there are nearly 200 thoroughbred horses. To supply all these animals with ground feed, a small flour mill is maintained with a capacity of 50 barrels of flour a day, where a large portion of the grain produced in that section is made into flour and the waste utilized for cattle feed. This flour mill is driven by a large electric motor.

### The Homestead

Electricity plays no insignificant part in adding to the comfort of those who enjoy the hospitality of the Ryan homestead. The energy for lamps for the main residence is furnished by a storage battery located in the basement which is charged from the main power plant. Every room in the large mansion is provided with an abundance of electric light and electricity is also extensively used about the building for heating and other purposes. There are electric dish warmers in the kitchen, electric heaters in the chambers and electric cooking devices for special service.

In order that the electric service need not cease even if the main power plant should meet with some unlooked-for accident, an auxiliary plant is located about 300 yd. from the main power station, which has been arranged for parallel operation with the main plant. In this auxiliary power house, which was the initial electrical equipment on the estate, is located a 50-hp. gas producer plant similar in operation to the one in the main power house. A 45-hp. three-cylinder Nash engine is belted to a 37½ kw. alternating current General Electric generator. This plant, though somewhat smaller, is operated nearly the same as the main plant and is held in readiness to be instantly started up in case of an emergency.

A mile away is still another gas producer plant where a 37-hp. gas engine is direct connected to a powerful pump which forces water into a large reservoir with a capacity of 365,000 gal. This reservoir is located on a hill, so that the water system for the entire place is operated by gravity, giving an abundant supply of water as well as ample fire protection.

This electrical plant has been in successful operation for nearly a year, and the foreman of Mr. Ryan's plantation speaks in the warmest terms of its conveniences, flexibility and safety. The apparatus was installed by Westenberg & Williams of New York City, and the electrical equipment is almost entirely General Electric apparatus. Already plans are under way for extensive improvements of the electrical apparatus and ultimately electricity will be employed wherever power is required about the plantation.—*Electrical World*, January 26.

A bill has been introduced in the Indiana Legislature providing for putting the Technical Institute at Indianapolis in charge of Indianapolis school authorities and authorizing a city tax to maintain the institution, which is to be collected in the same manner as taxes for other school purposes.



## The Acme Blueprint Machine

### A New Mechanism for Sensitizing Blueprint Paper and Making and Drying the Prints

A new type of blueprint machine, known as the Acme, has been designed and placed on the market by the M. & L. Engineering & Machine Works, 210 Canal street, New York City. The special feature of this machine is that it will coat or sensitize the paper for making the prints, produce the prints at the same time without extra labor and dry them after they have been washed without any additional expense. Fig. 1 shows a finished print issuing from the machine, while Fig. 2 is a view of the opposite end showing the drive.

The construction of the machine is very rigid, as cast iron and steel are employed throughout. It is built in three distinct parts. The first is the main frames, which

of the machine and the paper passes from the coating chamber at the bottom to a roller at the top and then down to the bottom and up again to a point about half the distance between the top and bottom of the section where it passes out. Electric heaters dry the paper so that it is in the proper condition for printing when it is led out of this chamber. The coated and dried paper is then led around the elliptical printing chamber and then passes out as a print ready for washing.

The coating rollers and the pans in which they rotate are enameled to protect them against the action of the chemicals used. The scrapers are raised or lowered by a hand lever within easy reach of the operator to regulate the amount of scraping. This lever can also be adjusted to stop the coating process without interfering with the use of the machine for producing blueprints.

The paper is pulled by pure rubber belts during the process of printing. These belts surround and travel around the elliptical glass printing chamber, and pro-

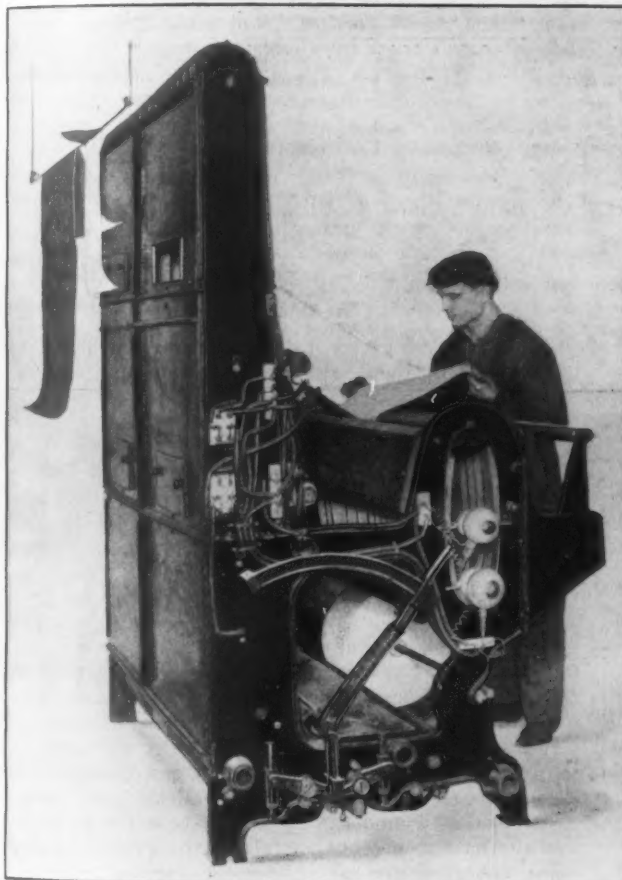


Fig. 1.—View Showing Finished Print Coming Out.

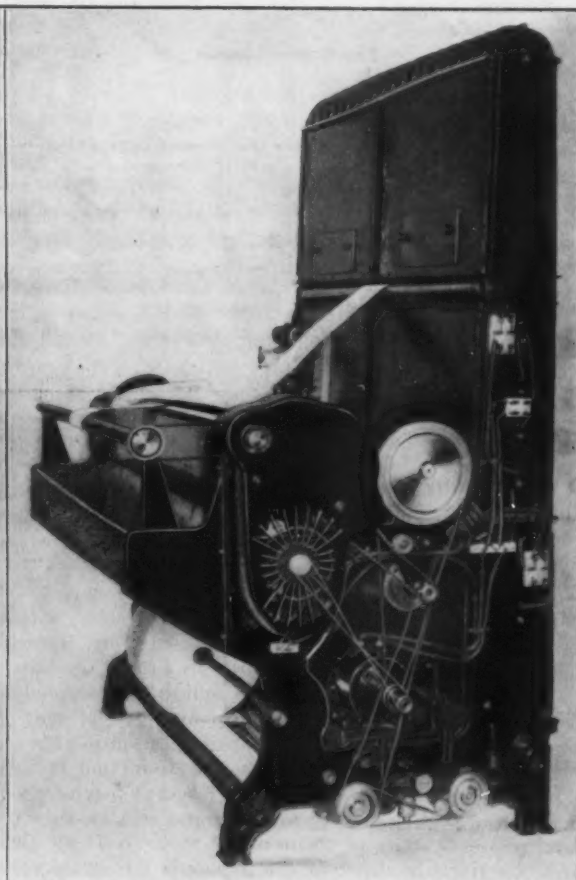


Fig. 2.—View of Opposite End Showing Drive.

Two Views of the Acme Coating and Blueprint Machine Made by the M. & L. Engineering & Machine Works, New York City.

are made of cast iron and connected with steel tubing and angle iron, while the drying chamber that is the upper portion of the vertical member is made in a separate section so as to be readily removable. The receiving box, which is located in the front of the machine and into which the prints drop as they are finished, forms the third section. All of the rolls used in the machine are of seamless steel tubing highly machined and journaled in ball bearings, which are also used on all the moving parts. The drive is of the variable speed type, and is composed of a two-step cone pulley, on which the belt is shifted by a hand wheel. The main drive is from this pulley through steel chain and sprockets. All the gearing is covered, which eliminates noise and also the danger of the operator becoming caught in the gears.

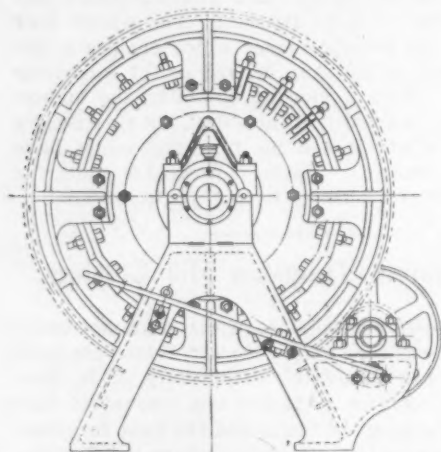
A roll of ordinary white paper is put in place in the lower front part of the machine and one end of this roll carried over to the first coating roller and held in position against it by an idler. After leaving this roller it passes over a glass scraper to the second coating roller. It is again scraped to insure a smooth coat and then enters the drying chamber. This occupies the entire rear

vision is made for securing the proper tension at all times regardless of the stretch. The printing frame is made in two sections, so that it can be swung back to clean the lamps or the glass walls themselves. As the prints issue from the machine in the form of an endless strip of paper they are wound up on a roll. After the prints have been washed, if desired they can be dried by hanging them on lines back of the machine, as the heat radiated by the coils in the driving chamber is sufficient for this purpose, especially if the doors in the cover of this chamber are opened.

Two sizes of machines are built; one will handle paper 54 in. wide, while the other, which is the one illustrated, is limited to paper 20 in. in width. An extensive use of the latter machine is the making of blueprint records for insurance companies and factories having a large amount of this work to do each day. The machines are regularly equipped with Cooper-Hewitt lamps 42 in. long. However, if desired the machines can be specially equipped with a row of arc lamps or a row of tungsten lamps. It is claimed that the machine will operate at the cost of 19 cents per hour.

## The Calumet Crane Type Tumbler

Patents on a new type of tumbling barrel have been recently applied for by the Calumet Engineering Works, Harvey, Ill. When it is necessary to pick up the barrel from the standards with a crane and carry the load of



A New Crane Type Tumbler Made by the Calumet Engineering Works, Harvey, Ill.

castings to any desired part of the cleaning room, this tumbler is intended to be used instead of the old roller type as well as for carrying the barrel itself into the foundry for loading and unloading.

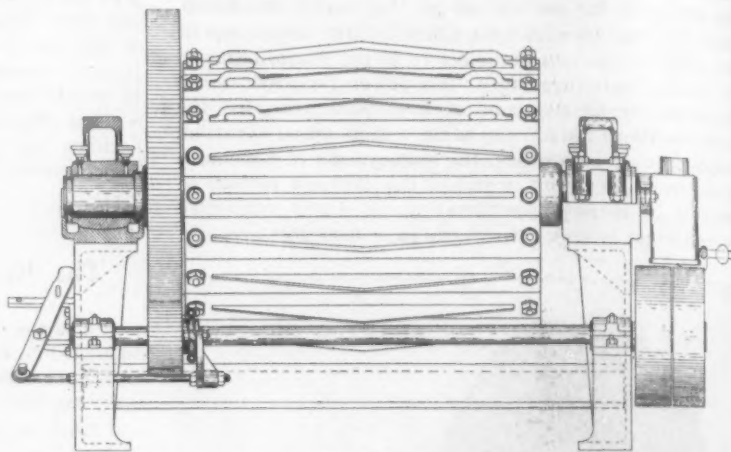
In addition to being able to lift the barrel from the standards for loading and unloading the castings, this new tumbler also possesses a positive drive which was not possible with the older style. This drive is of the customary type, a gear being mounted on the circumference of the barrel at one end and meshing with a pinion on the driving shaft. When it is desired to lift the barrel from the standard, the pinion is first slid out of mesh with the gear after which the barrel is lifted by placing the crane hooks under the cast steel lifting strap. This strap is fastened to a solid heavy bearing that is clamped to the trunnion by a retaining ring.

**Carnegie Technical School Lectures.**—A series of lectures is to be given in the School of Applied Industries in the Carnegie Technical Schools, Pittsburgh, for the benefit of the students. A complete list of these lectures, together with names of the lecturers, is as follows: January 26, "Modern Foundry Practice and Its Demands," by Thomas D. West, foundry expert and manager, Cleveland, Ohio; February 9, "Spur and Bevel Gearing," by George W. Klages, superintendent of the John A. Brashier Astronomical Works, Pittsburgh; February 23, "Spiral and Worm Gearing," by George W. Klages; March 9, "Cupola Practice," by John C. Knoeppel, Knoeppel Company, Buffalo, N. Y.; March 23, "Glass," by J. I. Arbogast, glass specialist, Pittsburgh; April 6, "Industrial Education," by Samuel Hamilton, superintendent Allegheny County Public Schools; April 20, "Modern Developments in Electric Power Stations," by Charles Sanderson, Westinghouse Electric Mfg. Company, Pittsburgh; May 4, "Large Engines of Duquesne Works," by H. L. Schreck, Mackintosh-Hemphill Company, Pittsburgh.

The Clark Car Company, manufacturer of balance door dump cars, has removed its offices from the Frick Annex to the Henry W. Oliver Building, Pittsburgh.

## The Triumph Type L Transformer

The Triumph Electric Company, Cincinnati, Ohio, has recently placed on the market a new line of light and power transformers for use on overhead single phase circuits. Fig. 1 is an exterior view of the transformer,



showing the manner in which the leads are brought out, while Fig. 2 shows the coils.

These transformers are built for 1100 and 2200 volts on the primary and 110 and 220 on the secondary. The normal frequency is 60 cycles, but transformers can also be furnished for operating between 50 and 140 cycles. The shell type of construction is employed. In

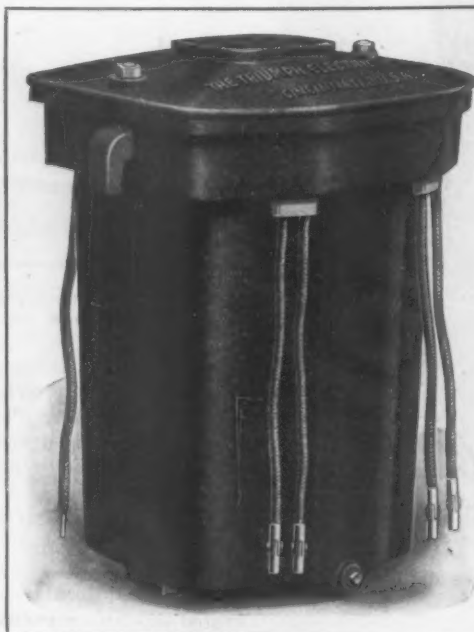


Fig. 1.—The Shell.

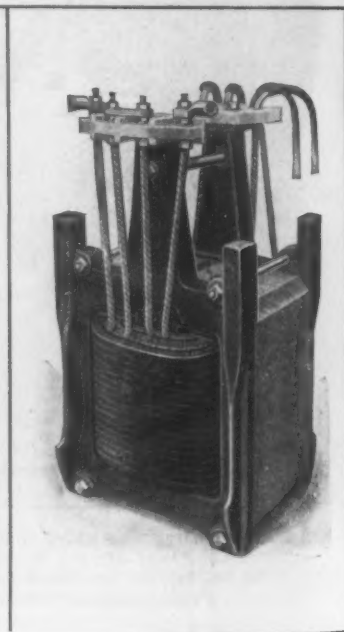


Fig. 2.—The Coils.

Two Views of a New Lighting and Power Transformer Made by the Triumph Electric Company, Cincinnati, Ohio.

selecting any particular kind of transformer, the losses occurring in operation are, next to the mechanical construction and durability, the most important consideration. A low core loss, while highly desirable, is frequently obtained at the expense of other important characteristics, such as an excessive copper loss and poor regulation. Too much insulation will also produce high reactance, poor regulation and cause over-heating with a correspondingly low efficiency. Although core losses should be eliminated as far as possible, as they are continuous, good regulation is even more important. In these new transformers, which are known as the Triumph type L, the regulation is good and the copper and core losses are low. The transformers are dried in a vacuum, and the coils are impregnated with a special insulating compound which is said to possess a very high melting point and be absolutely insoluble in oil.



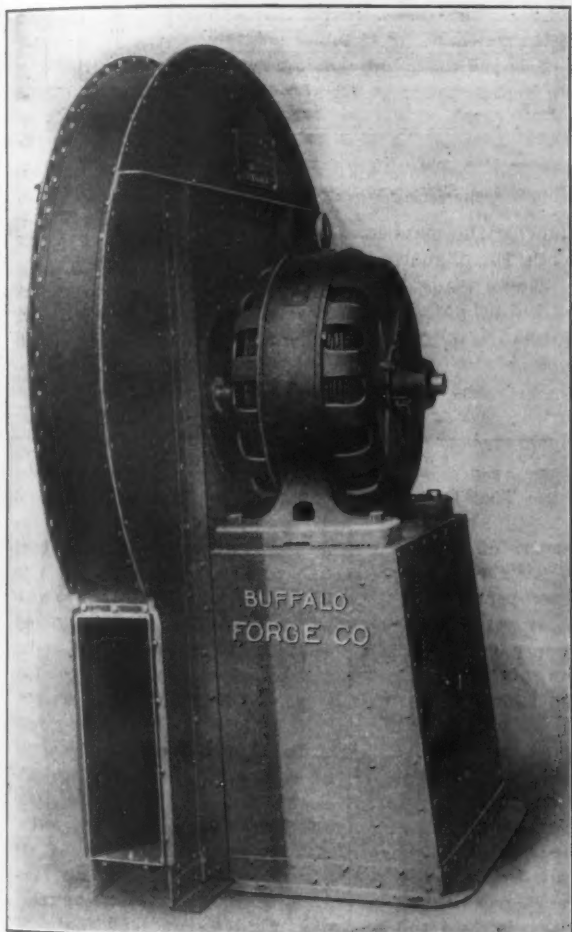
## The Buffalo Steel Plate Pressure Blower

Blowers, on account of their location in the foundry, generally require some independent unit to drive them. The first prime mover connected to high pressure centrifugal blowers for cupolas, forges and furnaces was a small steam engine. These were very uneconomical and with the advent of the electric motor they were abandoned. Since that time blowers have taken a large percentage of the output of the various electric motor manufacturers. In driving centrifugal fans, the power required varies approximately as the cube of the speed, provided the other conditions remain the same, and as speed variation is generally very desirable, the employment of resistance in the armature circuit, which is the cheapest method of securing it, is not objectionable. A direct connected electric motor is undoubtedly the most desirable arrange-

fan of such proportions as to be capable of operation at the speed of an electric motor. For use in cases of this kind, another line of blowers known as the two-stage type has been designed. In general the design follows that of the steel pressure blower, but a cast iron shell is employed, and the blower has a double casing with two blast wheels on the same shaft. In a blower of this type the air enters the second wheel at the pressure that has been imparted to it by the first. The wheels may or may not be the same diameter which enables a differential pressure to suit any desired set of conditions to be obtained. With a view to obtaining the highest possible efficiency the width of the wheel, the air passages between the two wheels and the inlet and outlet have been carefully designed. These blowers are built for pressures of between 2 and 3 lb. per sq. in.

## The Benjamin Tungsten Mill Cluster

Up to the present time the use of the arc lamp for industrial lighting has been quite general. While this form of illumination has been fairly satisfactory, it is, however, expensive, requires a considerable amount of time and labor for trimming the lamps and the light furnished is not of the best quality. On this account the tungsten lamp, which is used so extensively for store and public building lighting by reason of its exceptionally good quality of light and a reduction of approximately one-third in the amount of current consumed, is now invading the in-



A Direct Motor Driven Centrifugal Blower Having a Capacity of 10,000 Cu. Ft. of Air Per Minute at a Pressure of 10 Oz. Per Sq. In.—Built by the Buffalo Forge Company, Buffalo, N. Y.

ment, although the great difference between the speeds of the blower and the motor has prevented the wider application of motor drive to centrifugal fans. Besides this there is also another difficulty encountered in the use of alternating current motors for this work, as in many cases the speed range of these motors is not great enough to accommodate the desired blower speeds.

On account of these two difficulties the engineers of the Buffalo Forge Company, 490 Broadway, Buffalo, N. Y., have designed a special line of steel plate pressure blowers that are especially adapted for motor drive. The diameter of the blast wheels is large, which permits a great peripheral speed and high pressure to be secured at a comparatively low rotative speed, thus enabling standard types of motors to be used. In constructing these blowers great care was taken to secure a very accurate running balance and with that end in view the hubs and spiders are heavier than the usual construction and the fan housings are heavily braced. These blowers are built for pressures as high as 18 and 20 oz. per sq. in.

It is not always possible to build a large diameter



A New Type of Tungsten Mill Cluster with Steel Reflector Made by the Benjamin Electric Mfg. Company, Chicago, Ill.

dustrial field. The Benjamin Electric Mfg. Company, 120 South Sangamon street, Chicago, Ill., is marketing a new type of mill cluster. The principal advantages claimed for this new lighting device are a superior quality of light, 1500 cp. of reflected light as compared with 1300 cp. of the flaming arc and a saving in operating expenses including current, lamp renewals and depreciation of from 25 to 30 per cent.

Two forms of cluster are furnished, both having reflectors 24 in. in diameter. The first which is style illustrated has an enameled steel concentrating reflector, and is intended to be used where the lighting units have to be suspended at some height to clear traveling cranes, &c. The other type of cluster has an enameled steel flat cone reflector for an installation requiring the units to be suspended at a height of from 25 to 30 ft. above the floor. Each fixture has a patent shock absorber to protect the lamps which are of the 250-watt large base series type. These lamps can be burned either in series on a 220-volt circuit or in series multiple on a 110-volt circuit.

Arthur D. Little, Inc., Laboratory of Engineering Chemistry, 93 Broad street, Boston, Mass., has been appointed official chemist of the American Brass Founders' Association. In accepting this appointment, the company states that it has done so with full realization of the responsibilities it carries and will endeavor to make its laboratory an effective clearing house of scientific information relating to all nonferrous alloys. A special charge will be made to members of the association for analyses of alloys of \$1 per determination.

## New Tools and Appliances

*This is essentially a news department for which information is invited.*

**Double Housing, Heavy Duty Forge Planer.**—The Detrick & Harvey Machine Company, Baltimore, Md., has recently developed an extra heavy duty double housing forge planer, with a new type of induction drive. The machine which is nominally rated as a 48-in. tool will plane work 50 in. wide and 48 in. high. The table is 43 in. wide and 12 in. deep over the ways, one of which is flat and the other a V. The bed has a depth of 22 in. and three vertical metal ribs extend throughout its entire length. The housing cheeks are 32 in. deep and 55 in. long, while the housings are of rectangular box cross section with faces  $16\frac{1}{4}$  in. wide. These housings are secured at the top by a tie extending from the front to the rear, which tends toward great rigidity. The cross rail, which is 19 in. high and 20 in. deep, is raised and lowered by an independent electric motor. The heads, of which there are two, are of heavy construction with steel aprons and holders. All the gearing except the driving worm is of steel cut from the solid. The worm is of phosphor bronze, and has six teeth in engagement with the table rack. This rack is 9 in. wide and is cut from solid forged steel bars. The total weight of the tool is 53,000 lb., exclusive of the motor and the drive; the table weighs 9100 lb.; the bed, 14,500 lb., and the cross rails, 3100 lb. The new type of induction drive furnishes variable cutting speeds of from 35 to 50 ft., and return speeds of from 65 to 100 ft., either of which can be changed quickly and independently of the other. If desired, the machine can also be furnished for belt drive from a line shaft or an electric motor.

**Molders' Ramming Stand.**—The New Britain Machine Company, New Britain, Conn., has placed on the market a ramming stand for use in connection with work in a jobbing foundry that must be hand molded. The design of the stand is such that the struck sand falls to each side of the column where it can be easily shoveled up and used again. The base and the top of the stand are machine finished, while the supporting column which is hollow gives the required rigidity. The top is arranged for holding mold boards with cleats having a center distance of about 10 in. and measuring 21 in. from front to back. The height of the stand is 30 in., and its shipping weight 200 lb.

**A Universal Oil Stone Slip.**—The Norton Grinding Company, Worcester, Mass., has recently added to its line of India oilstones a universal slip, which by reason of the great variety of sharpening faces can be used for all styles of cutting edges. It is stated that the cutting edges of any shape of tool can be sharpened easily and accurately. It balances perfectly to the angle of the cutting edge of the tool, and its shape is such that no matter which face is being used, the slip can be held comfortably in the hand.

**Machine Recorders.**—The General Electric Company, Schenectady, N. Y., has recently put on the market a new line of curve drawing instruments which are easily adaptable for obtaining information on motor driven machines. The internal parts consist of a clock mechanism for driving the chart, the measuring element and a damping device. To produce an instrument which can be operated on both alternating and direct current circuits, the electrical element is of solenoid type with gravity control. With one of these instruments it is possible to obtain information regarding the time of operation of a machine, both light and loaded, and the time required to change work.

**Combination Boring, Drilling, Milling and Tapping Head.**—A new type of boring head which is known as the type C head is being built by the J. Morton Poole Company, Wilmington, Del. It is designed to use milling cutters, the diameter of which does not exceed 12 in., for cutting in either a horizontal or a vertical direction. The spindle diameter is 6 3-16 in. and the stroke is 16 in. The bearing of the saddle on the cross rail is  $28\frac{3}{4}$  in. It is driven either by a 5-hp. adjustable speed reversing motor or by a two-speed countershaft and a three-step cone pulley together with two mechanical speed changes.

Twelve spindle speeds, ranging in approximately geometrical progression from 8 to 96 rev. per min., are available. For boring there are four feeds, ranging from  $1\frac{1}{64}$  to  $\frac{1}{8}$  in. per rev. of the spindle, and the same number of milling feeds, the range being from 1-80 to 1-10 in. For vertical cutting there are 14 feeds, ranging from 4-9 to 1-720 in., and eight horizontal cutting feeds, the limits being 1-10 and 1 in. The number of feeds for facing and turning is the same as that of the maker's standard head.

**Ferracute External Notching Press.**—For cutting the notches in the circumferences of armature disks, the Ferracute Machine Company, Bridgeton, N. J., is building an external notching press so constructed as to be capable of turning out accurate work at very high speeds. A pawl acting directly upon a ratchet performs the indexing and provision has been made in the construction of this mechanism to avoid all looseness, while the notches can be accurately located with reference to any holes in the disks by an adjustable jaw on the lock which controls the stopping position. After each revolution of the disk, the slotting ram stops automatically at the highest point of its stroke, and the pawl is thrown out of mesh with the ratchet simultaneously. The operator does not have to take any thought as to when he presses the treadle as a timing device working upon the hub of the flywheel prevents the press from starting at the wrong time. The shaft is run continuously, and the ram is connected to it through a pitman and a ram clutch, thus eliminating the clutch troubles incident to operating presses at high speeds. This tool will notch disks from 2 to 24 in. in diameter and medium sized work having about 20 or more notches can be turned out at the rate of 400 strokes per min. Where notches are to be cut in large disks and especially if gang dies are used, cutting two or more at once, the speed may fall as low as 200 strokes per minute.

**A 22-1-2-In. High Speed Drill.**—The Superior Machine Tool Company, Kokomo, Ind., has recently added a 22½-in. size that is fully automatic in its operation to its line of upright drills. This new machine is designed to handle high speed steel drills and machine or pipe taps up to  $1\frac{1}{2}$  in. It will drill to any depth not exceeding 8 in., and the spindles can be automatically tripped at any predetermined point by adjustable dogs. After the spindle has been tripped, it backs out and goes forward again in about 1-10 sec. By adjusting the set screw in the trip lever the spindle can be made to feed downward, automatically trip itself, run back to its upper position and stop. When at the upper limit of its motion it can be started downward by throwing a lever operated from the front of the machine. Positive geared feeds with all the gears heat treated and ground are provided. The spindles have ball thrust bearings, and the sleeves are graduated. The construction of the table, which is rigid and heavy, is of the knee type. The working surface of the table is 17 x 40 in. and raising and lowering the table is effected by a telescoping screw. Both spindles can be started or stopped by a shifter lever, or each can be controlled independently by foot pedals on the foot of the base. The operating levers are all located so that the workman can reach them easily without changing his position.

**Heavy Duty Radial Drill.**—The Detrick & Harvey Machine Company, Baltimore, Md., has brought out a powerful radial drill that can be attached to the cross head of a gantry crane or to a heavy building column. A special feature of the drill is the direct drive of the spindle by a vertical adjustable speed motor mounted on the drilling head and driving the spindle directly through spur gearing having a ratio of 1 to 4, the speed of the spindle ranging from 100 to 400 rev. per min. The drill spindle is  $3\frac{1}{2}$  in. in diameter, and it has a vertical movement of 18 in. by either hand or power. Power feed is provided, the four changes ranging from 0.0076 to 0.0625 in. per rev. of the spindle. The vertical face of the radial arm, which is of box section, is  $24\frac{3}{4}$  in. wide. The arm is heavily braced to a cylindrical vertical portion resting upon a ball bearing seat in a pivot bracket. The maximum and minimum radial drilling capacities of this tool are 6 ft. 6 in. and 2 ft. 6 in. respectively.



## The Machinery Markets

Quiet buying on the part of the railroads has improved the general tone of the machinery trade. Inquiries have increased materially in the New York market, and a decidedly better call for metal working machinery has developed. The South has become an excellent market for second-hand equipment. The railroads there are large buyers of used tools, and their purchases of late have resulted in materially advancing the value of that class of machinery. There are increased inquiries in Chicago. In Cincinnati a railroad buying movement promises to increase trade, and inquiries from the general manufacturing field are coming in more freely. The second-hand machinery market is especially good in Philadelphia, and inquiries are encouraging. Railroad supply companies promise to be good purchasers in the New England market, and the trade there is bidding on a \$100,000 list of machine tools for a large metal working machinery manufacturing company. The railroads are occupying the attention of the trade in St. Louis, where the outlook for future trade is reported to be good. The New York, Ontario & Western Railroad has a good-sized list out in New York, consisting of machine tools and blacksmith shop equipment.

### New York

NEW YORK, February 1, 1911.

A decidedly better business is being done in New York than at any time within the last two months. A good indication of the trend of trade is shown in the inquiries that reached one New York machinery house during the three days of this week, when they averaged 30 per cent. larger than on the corresponding days of a month ago. Business done in January in the way of actual orders was not as large as during December, but inquiries were better than in any month since September. A great deal of the business that came forward in January from all indications will be closed out during the present month, and the outlook in the trade, all things considered, is more encouraging than it has been at any time since the spring of 1910. During the last week the Simms Magneto Company, whose enterprise has been mentioned before in these columns, closed out for its tool room equipment, which amounted to an expenditure of about \$5000, and a supplementary list of general machine shop equipment will be out in the near future. A large sewing machine manufacturing company is making inquiries with a view to adding to its machine shop equipment, and the mechanical departments of a number of Southern railroads have come forward with requests for catalogues and estimates for machine tool equipment for early delivery. No new railroad inquiries of any consequence have come into this market. Second-hand machinery is becoming rather scarce, and good prices are being taken for used equipment. Many people who have asked for prices on second-hand material have of late changed their requests for bids by asking for figures on new machinery, and as about every kind of machine tool, with the exception of automatic machinery, can be had on a few days' notice, it is thought that the present scarcity of used machinery will result in an increasing call for first-hand machinery. The export business continues surprisingly good. Two leading export houses have been placing large orders for delivery in Continental Europe direct with manufacturers. The United States Lighting & Heating Company, with New York offices at 30 Church street, is buying machine tools in this market for delivery to its new plant at Niagara Falls, N. Y. The company has been equipping a large plant for the manufacture of storage batteries and commercial trucks and lighting and heating systems for railroad trains. Another large buyer in this market at present is the Lewistown Foundry & Machine Company, Lewistown, Pa., which is placing orders for a general line of machine tool equipment amounting to nearly \$1000.

The International Steam Pump Company, 115 Broadway, New York, has completed negotiations for the sale of a block of its 20-year 5 per cent. bonds, which is part of the balance of \$3,500,000 remaining from its \$12,000,000 bond issue of 1900. These bonds are being sold to defray the cost of improvements on the company's various plants and to make final payments on the F. M. Prescott Steam Pump Company of West Allis, Wis., Jeanesville Iron Works Company, Hazelton, Pa., and the Denver Rock Drill & Machinery Company, Denver, Colo. The company is planning to add to the manufacturing equipment of most of its plants. It will be remembered that a little more than two years ago the International Steam Pump Company issued a very extensive list, a large part of which was afterward withdrawn because of the business depression. It is very probable that this list will be put forward again to provide for machinery for the proposed extensions.

Alexander Potter, consulting engineer, 116 Liberty street, New York, has charge of the construction of a large water works at Oklahoma City, Okla., which will cost about \$1,500,000. The enterprise includes the construction

of a concrete dam 1000 ft. long, pumping station capable of pumping 20,000,000 gal. of water a day and a water purification system to handle 10,000,000 gal. of water a day. Mr. Potter is also consulting engineer on the construction of a garbage disposal plant for the city of Muskogee, Okla., which will necessitate the expenditure of \$35,000. The power for operating the plant will be furnished by burning combustible waste material and most of the equipment for this enterprise will be special machinery.

Inquiries out in the New York market indicate that the General Electric Company, Schenectady, N. Y., will shortly proceed with its plans to add to its plant at Erie, Pa. Mention of the company's enterprise has been made in these columns from time to time, and it may be remembered that a large foundry was recently built there. It is understood that inquiries now out indicate that a machine shop will be added to the Erie plant and perhaps the more ambitious plans of the company toward making Erie a large manufacturing unit in its system will be carried out.

Frederick A. Waldron, industrial engineer, 37 Wall street, New York, has been awarded a general contract for the construction of a large factory building at Glenmore and Snediker avenues, Brooklyn, N. Y., for Shapiro & Aronson, 24 Morton street, Brooklyn. The plant will be used for the manufacture of chandeliers. The plans call for a building 100 x 100 ft., five stories and basement, and will be equipped with metal working machinery.

The Lord & Burnham Company, Irvington, N. Y., builder of greenhouses, is planning to make extensive additions to its works at Des Plaines, Ill. The company has 16 acres of land there and has completed the first unit, 150 x 400 ft., saw-tooth roof construction, of what will be the largest plant of its kind in America. The completed building is to be used as a power plant and wood working shop. Most of the machinery has been purchased.

The Rome Mfg. Company, Rome, N. Y., which recently arranged for the erection of a building 60 x 300 ft., two stories, will use its added manufacturing capacity as a department for the making of its rubber goods. Most of the equipment to be installed will be special rubber working machinery.

The Morrin Climax Boiler Company, which recently purchased the plant of the West Pulverizing Machine Company at Mallory and Pollock avenues, Jersey City, N. J., has been incorporated, with an authorized capital of \$100,000, to manufacture boilers, steam generators, pipe fittings, &c. T. F. Morrin, E. T. Morrin and T. J. O'Day are the incorporators.

George Fuller, consulting engineer, 111 Broadway, New York, is preparing plans for the construction of a sewerage system and disposal plant for the municipality of North Plainfield, N. J. The plant will cost about \$100,000.

The city of Aurora, N. Y., is preparing plans for a system of sewers and a disposal plant to cost about \$100,000. Frederick K. Wing is the engineer in charge.

The Ithaca-Auburn Power Company, recently organized with a capital stock of \$50,000, has purchased the Remington Power plant at Ithaca and will enlarge and re-equip it to provide operating power for the Auburn-Ithaca Inter-Urban Trolley Company in addition to power for the Ithaca Electric Railway Company and the lighting of the streets of Ithaca.

The Alberger Gas Engine Company, recently incorporated in Buffalo with a capital stock of \$221,000, has in addition to taking over the gas engine business heretofore conducted by the A. H. Alberger Company, acquired substantially all of the capital stock of the Howard Iron Works, Buffalo, which concern has been controlled since 1905 by the Otis Elevator Company. The Absorbing Company will, besides the manufacture of gas engines from 15 to 500 hp. at the Howard Iron Works plant, continue to carry on at this plant the business of general foundry and machinists and manufacturers of transmission machinery

## THE MACHINERY MARKETS

and the Burdick bolt and nut machines, the same as was done by the former management of the Howard Iron Works. The officers of the new company are: president, Alvin H. Alberger; vice-president, Edward B. Holmes, president, E. & B. Holmes Machinery Company; secretary and treasurer, Harvey L. Brown.

The Wayne County Gas & Electric Company will install a number of electric motors of various sizes in its power plant at Lyons, N. Y., to replace old motors. The cost of the improvements to be defrayed one-half by the company and one-half by the consumers of electricity at Lyons.

The Lockport Textile Company, Lockport, N. Y., has completed plans for the erection and equipment of an additional mill, which will double its present capacity.

Construction work is soon to be commenced on the enlargement of the plant of the Remington Typewriter Company, Illion, N. Y., for which plans have been completed.

The Laundry Plant of the Mohr & Hunter Company, Cherry and Michigan streets, Buffalo, N. Y., is to be largely increased and new machinery equipment installed.

The City Dairy Company, Rochester, will erect a two-story addition to its creamery at Hudson avenue and Woodbury street, and install new machinery.

The Rochester Gas Engine Company, Rochester, N. Y., has completed plans for its new plant and construction work will begin early in the spring.

The Troy Wire Goods Company, Troy, N. Y., has been incorporated with a capital stock of \$10,000 to manufacture wire specialties. The incorporators are Howard B. Bone-steel, Horace A. Olmstead and Clifford Her.

### Chicago

CHICAGO, ILL., January 31, 1911.

The general demand for machine tools in this territory continues to improve, although it has not yet reached a normal volume of business. There are more inquiries from manufacturing users of tools and there is also better progress in closing sales on scattering inquiries. If all the inquiries that are coming in were being closed promptly the market would be quite satisfactory, but a large proportion of the buyers who are figuring in this market are chiefly interested in getting prices and data on which to place business later on, when the improvement they hope for in their business actually appears. The jobbing foundries and machine shops have been running light this winter, and their experience in buying iron the past year encourages them to wait until improvement actually appears in the form of contracts and orders. The machine tool men are looking with interest on the reports of better conditions in the steel industry, especially in railroad buying, as this will have a good effect on the railroad equipment and supply industries. The manufacturers who sell to the agricultural trade have been steady buyers of tools and shop equipment all winter.

The Skillin & Richards Mfg. Company, Chicago, engineer, founder and machinist, will remove its plant from its present location at Fulton and Union streets to Courtland street and Forty-sixth avenue, where a new factory building 118 x 410 ft. is being erected. The building will be equipped with a traveling crane and will cover a floor space considerably in excess of an acre. The company expects to occupy the building by May 1.

The Leader Iron Works, Decatur, Ill., has increased its capital stock from \$100,000 to \$200,000. It is the intention of the company to do considerable building during the year and install new equipment. The company will also extend its selling organization.

The Burgess-Norton Mfg. Company, Geneva, Ill., is contemplating the erection of an addition to its plant, for which plans have not been prepared.

Peter Brothers, Algonquin, Ill., are erecting a new machine shop building, 55 x 120 ft., two stories. A new lathe and drill press will be purchased. Electricity will be used for operating power.

G. E. Hixon, Harrisburg, Ill., is interested in a company which is considering the feasibility of the erection of a power plant at the Grand Rapids dam, near Mount Carmel, Ill., where a site was recently purchased. It is the intention of the company to put in a plant with 8000 to 10,000 hp., with a steam auxiliary plant.

The City Council of Sidney, Ill., is preparing to establish a municipal lighting system.

The Orinda Stove & Mfg. Company, Quincy, Ill., has been incorporated with a capital stock of \$50,000. The incorporators are C. H. Wurst, Henry Lange and A. H. Stork.

The plant of the Commonwealth Steel Company at Granite City, Ill., was damaged by fire January 22, to the extent of about \$15,000. The loss is covered by insurance.

### New England

BOSTON, MASS., January 31, 1911.

Machinery builders and their representatives who have been visiting other sections of the country are returning home with confidence greatly increased. They report a stronger sentiment practically everywhere. While the average manufacturing plant is not doing more than a fair business, expectations are a good deal better, in many cases based upon tangible knowledge of future orders. It is especially significant that the large manufacturers of railroad supplies and equipment in various parts of the country are preparing to do a very large business, and are especially interested in heavy semi-special machinery, which will improve their product and at the same time reduce costs. The viewpoint of the average manufacturer and dealer in this territory in regard to the situation is changed in a marked degree. Practically no one appears to doubt that the improvement, already felt to some extent, will become more strongly accentuated as the spring approaches nearer.

And important development of the week is the entrance of Beaudry & Co., Inc., 141 Milk street, Boston, into the market for \$10,000 worth of machine tools, for which quotations are being asked. The company manufactures the Beaudry Champion power hammer and duplex forging presses, combining press, shears and punch.

The American Warp Drawing Machine Company, Boston, is finishing its new shop building at Harrison Square, and will occupy it in a short time. Not much new machinery has been installed, but the company is planning to duplicate the structure in the comparatively near future, which would mean extensive purchases of tools. Ample land is available on the new site. The building is 60 x 103 ft., two stories. The demand for the company's machinery is very heavy, necessitating running overtime, and the indications are that the new shop will not be adequate for very long. The present works are at 289 A street, South Boston.

The Sturtevant Mill Company, Boston, Mass., manufacturers of crushing and other mining machinery, suffered a loss of about \$20,000 in the recent fire in the shops at Harrison square, the damage being confined mostly to the buildings, lighting, belting, shafting, engine and some other machinery. The company states that it is too early to say what will be required in the way of new equipment. It is possible that a change will be made to electric drive.

The New England Coke & Coal Company, Boston, has out specifications for two colliers, to cost not in excess of \$1,000,000. If the bids prove too high, orders may be postponed.

The new foundry of the Vanadium Metals Company, East Braintree, Mass., will be located on land adjacent to the plant of the New London Ship & Engine Company, at Groton, Conn.

The outlook for New England is for large industrial expansion this year. The list of concerns which have either begun the erection of new works or additions, or which plan to increase equipment in a large way in existing works, is a long one, and it is known that other important improvements will be announced soon. Some of the companies already mentioned are the Trumbull Electric Mfg. Company, Plainville, Conn.; Stanley Machine Company, Salem, Mass.; United Shoe Machinery Company, Beverly, Mass.; General Electric Company, Lynn and Pittsfield, Mass.; Central Oil & Gas Stove Company, Gardner, Mass.; Waterbury-Farrel Foundry & Machine Company, Waterbury, Conn.; H. B. Smith Company, Westfield, Mass.; Marcus Mason & Co., and the Ames Plow Company, Worcester, and the Gurney Heater Company, Boston, new works at South Framingham, Mass.; H. D. Smith Company, Southington, Conn.; Lake Torpedo Boat Company, Bridgeport, Conn.; C. O. Churchill & L. Holst, valve and foundry plant, Westfield, Mass.; Baird Machine Company, Oakville, Conn., works at Bridgeport; New London Ship & Engine Company and Vanadium Metals Company, works at Groton, Conn.; C. H. Metz, Waltham, Mass.; Oven Equipment & Mfg. Company, Stamford, Conn., at New Haven; S. A. Woods Machine Company, Boston; Ideal Switch Company, Plainville, Conn.; Steele & Johnson Mfg. Company, Waterbury; National Perforating Machine Company, Athol, Mass.; Bradley Car Works, Worcester; F. E. Wells & Son Company, Greenfield, Mass.; National Spring Bed Company, New Britain, Conn.; Potter & Johnston Company, Pawtucket, R. I.; Malleable Iron Works, New Britain; Screw Machine Products Company, Providence, R. I.; and A. H. Wells & Co., Inc., Waterbury.

The Boston & Maine will be the large buyer among the New England railroads, but the New York, New Haven & Hartford is not an unlikely factor in the machinery market. Nothing has been done by this road toward erecting large



## THE MACHINERY MARKETS

repair shops at the western end of its system, and they are needed there. While no definite knowledge is obtainable at this time, nor are reports current, still those who have been watching the situation at New Haven expect to hear something of the plans in the near future. The general intention is to build works at least as large as those at Readville, for both locomotive and car repairs.

### Philadelphia

PHILADELPHIA, PA., January 30, 1911.

Merchants and manufacturers report a continued quiet demand, with sales confined largely to single tool propositions. While prospective buyers are taking estimates on probable purchases, the actual placing of orders is in many cases deferred until the last possible moment and then urgent delivery required. This is particularly the case with recent inquiries coming from railroads, which seem disinclined to make any purchases that can possibly be avoided. Representatives of merchants and manufacturers in this city who have recently made trips over the territory usually known as the Philadelphia district report conditions as being unfavorable for any pronounced buying in the near future, except in the way of small lots, and even this class of buying is not very extensive. One prospective buyer in this territory, who had a large list out about a year ago for the equipment of a proposed new plant which was subsequently built, is now asking for proposals for practically the same equipment in second-hand tools. Manufacturers of tools and machinery note an irregular demand, better in the aggregate, however, than that during the closing month of 1910. The last half of January was also more productive in orders than was the first half, due no doubt to business having been held in abeyance pending the completion of inventory matters.

The demand for boilers and engines has not been very active; some fair inquiries are before the trade, but orders develop slowly.

The second-hand machine tool trade has been a shade more active, particularly in the way of inquiries. The rather extensive list of the M. E. Treadwell Company for its new plant, as advertised in a recent issue of *The Iron Age*, is being extensively figured on.

The Hess Steel Casting Company, Bridgeton, N. J., has about completed the erection of its buildings and has contracted for such equipment as is needed at this time. This company will manufacture steel castings of special design by a German process which Henry Hess, its president and also president of the Hess-Bright Company, Philadelphia, has acquired for North America.

The Metropolitan Electric Company, Reading, Pa., is taking bids for several lathes, drill presses and a grinder, all electrically driven, to be installed in its machine shop. R. Carpenter, New York is the consulting engineer.

Estimates are being taken by Walter Smedley, architect, for a seven-story reinforced concrete building, 47 x 122 ft., for light manufacturing purposes, to be erected at 633-35-37 Arch street, for Charles E. Morris.

The Phoenix Portland Cement Company, Nazareth, Pa., has under consideration, it is stated, extensive improvements to its plant. New buildings are proposed, as well as power equipment. The roasting, grinding and crushing departments of the plant will be materially increased if the plans under advisement are carried out.

Bergdoll & Pawling, engineers, will erect an eight-story concrete and steel manufacturing building, 35 x 84 ft., at the southeast corner of Broad and Carlton streets. Estimates for the subcontracts will be asked at an early date.

The Department of Public Safety, Bureau of highways, room 232, City Hall, opens bids to-day for the reconstruction of a bridge on the line of Forty-seventh street, over the West Chester & Philadelphia Railroad.

The Philadelphia Toilet & Laundry Company is having plans prepared by the William Steele & Sons Company for a brick and concrete factory building, 72 x 125 ft., partly for laundry purposes, to be erected at 1427-1433 Race street. Plans will be ready for estimate, it is stated, in the near future.

The Philadelphia & Easton Electric Railway is planning an extension from Doylestown to Lansdale, Pa., a distance of 10 miles. At the latter point a connection would be made with the Montgomery Traction Company, which line runs to Norristown and thence via Chestnut Hill to this city.

The Sanitary Can Company, Bridgeton, N. J., will increase the capacity of its plant. A one-story factory building, 115 x 208 ft., for the manufacture of cans, will be erected, on the completion of which the present factory building will be used for warehouse purposes.

Bids will be taken until February 7 by the Department

of Wharves, Docks and Ferries, city of Philadelphia, for furnishing one deck and derrick scow. Specifications may be obtained by applying to Joseph F. Hassakarl, acting director, 555 Bourse Building, this city.

### Cincinnati

CINCINNATI, OHIO, January 31, 1911.

If any change at all is to be noted in the local manufacturing situation, it is for the better. Inquiries for machine tools continue coming in freely, and with several firms there has been a slight increase in the amount of business booked. There is a rumor that two Western railroads, recently mentioned, will come into the market soon for small sized lists of tools, and it is known that the Queen & Crescent System will make purchase of equipment for its Somerset, Ky., shops at no distant date. Business from automobile manufacturers continues quiet, but machine tool salesmen report indications of a revival in this particular line, as practically all automobile makers are commencing to build commercial vehicles in connection with the pleasure cars now turned out.

One local firm reports a surprising number of inquiries for boilers, both for large and small units, which indicates that many new manufacturing industries are planned for the present year. Electrical machinery is in better demand, especially so are the smaller sizes of generators and motors.

The Potts-Rine Supply Company, Columbus, Ohio, has been incorporated, with \$25,000 capital stock, to manufacture and deal in engineering specialties and supplies. The incorporators are B. D. Potts, H. L. Potts, F. M. Rine, L. G. Williams and Frank Christ.

The Warner Mfg. Company, Toledo, Ohio, was incorporated, with \$500,000 capital stock, to manufacture automobiles. The principal incorporator is Thomas W. Warner of Toledo.

The John Dietz Mfg. Company, Cincinnati, manufacturer of the Dietz rubberboard washing machine, has moved into its new quarters at Eighth and Elm streets. It needs further woodworking machinery to complete its equipment, and is in the market for a jointer, surface planer, rip saw, band saw and boring machine.

The Carr Milling Company's plant at Hamilton, Ohio, was destroyed by fire January 28, and the reported loss is about \$120,000, partly covered by insurance. It is stated that the mill will be rebuilt, for which considerable power equipment and flour milling machinery will be required.

To manufacture furniture the Frank-Clapps Company has been incorporated at Toledo, Ohio, with \$30,000 capital stock, by E. C. Frank, George J. Budd, A. C. Budd, H. W. Clark, C. K. Southard and W. Clapp.

The annual meeting of Smith & Mills, machine tool manufacturers, Cincinnati, was held January 26. No change was made in the personnel of the officers. Albert S. Smith is president and treasurer; James Mills, vice-president and general manager; James E. Mills, secretary, and Ernest Mills, superintendent.

The Laidlaw-Dunn-Gordon Company, Elmwood place, Cincinnati, is shipping an air compressor of 4000 cu. ft. capacity to the Vesta Coal Company, which is a subsidiary company of the Jones & Laughlin Steel Company, Pittsburgh, Pa. This is the third of a series of seven machines for which the Laidlaw-Dunn-Gordon Company has an order from the company mentioned. Compressors for the government are also being built, with capacities running from 3500 to 4500 cu. ft., and for shipment respectively to the navy yards at Washington, Philadelphia, Brooklyn and Mare Island.

The Cincinnati Abattoir Company, Cincinnati, has had plans prepared for an addition to its refrigerating plant.

Plans have been drawn up by J. L. Epperson, architect, Canton, Ohio, for a manufacturing plant to be put up for the Lawrence Clay Products Company, at North Lawrence, Ohio. There will be four buildings in all, of brick and steel construction.

The Pressing & Orr Canning Company, New Holland, Ohio, is preparing to erect a canning factory.

The Hicks Ash Coal Company, Peytona, W. Va., will probably require some power plant equipment at an early date.

The recently mentioned project for a new paper mill has materialized and the Franklin Coated Paper Mill Company, Franklin, Ohio, has been incorporated with \$300,000 capital stock, and work on the proposed plant will begin at an early date. The incorporators are John J. Maloney, John Fischer, W. Symmes, B. Bickley and W. C. Hodges, all of Hamilton, Ohio.

The city of Mansfield, Ohio, is considering the building of a municipal electric lighting plant.

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Schenck & Williams, architects, Dayton, Ohio, have completed plans for the Beaver power building to be erected in that city. The structure will be 180 x 184 ft., three stories and of reinforced concrete construction.

Recent sales of the Triumph Electric Company include three 50-kva. alternating current generators for the Otis Elevator Company, one 150-hp. induction motor for H. T. Lloyd, mining engineer, Spokane, Wash.; 36 induction motors, ranging from 1 to 10 hp. for the Bishop Babcock Company, pump manufacturer, Indianapolis, Ind., and several other orders, among which are two generators for use in the new shops of the Missouri Pacific Railway Company. The Triumph Company's new brass foundry is now in full operation.

A party of Eastern capitalists are said to be interested in taking over the plant of the defunct Steel Foundry Company, Winton place, Cincinnati. W. B. Melish, Cincinnati, is receiver for the old company.

Sechler & Co., Cincinnati, carriage manufacturers, are remodeling the old Harkness & Cowing building, adjoining their plant at Fifth and Culvert streets. Two stories will be added to the building and the Grinnell sprinkler system installed throughout. The Queen City Paper Company will occupy part of the structure when the repairs are completed.

The William Powell Company, Cincinnati, reports an excellent business during 1910. It is making regular shipments on its contract with the Isthmian Canal Commission for globe and angle valves, up to and including the 4-in. size. This is the regular Powell Model Star valve that is furnished the trade, and which was selected by the Board of Engineers in competition with various other manufacturers.

The City Council of Canton, Ohio, has been petitioned for \$69,000 to be expended for improvements to its water works system. The improvements include stand-pipe, engine, generator, &c.

### St. Louis

ST. LOUIS, Mo., January 30, 1911.

Machinery merchants report business continuing fairly good this week.

The W. B. Knight Machinery Company, maker of vertical milling machines, finds business picking up and is well satisfied with the outlook.

The Kansas City Terminal Railroad has been buying a few tools for its new shop at Kansas City, Mo.

The Ward Mfg. Company, St. Louis, has been incorporated, with a capital stock of \$10,000. The incorporators are Willis E. Ward, John D. Moore and Jackson Guthrie. The company will engage in the manufacture of mechanical appliances.

The National Gas Machine Company, St. Louis, recently incorporated, has purchased for \$40,000 a three-story and basement factory on Wilson avenue, near the St. Louis & San Francisco Railroad, for the purpose of entering upon the manufacture of its gas machine. The president of the company is B. F. Fenn; H. G. Wernimont is the secretary and general manager.

The plant of the Ferguson Waterproof Company, manufacturer of oil cloth goods, at 2136 South Second street, was destroyed by fire January 25. The loss is estimated at \$55,000. Forrest Ferguson is the president of the company; Albert F. Baggott is its secretary and treasurer.

The Carroll Muzzle Company, whose plant is now at Carroll, Iowa, will remove to St. Louis in the near future and locate at 821-823 South Tenth street. The company, which has a capital stock of \$100,000, has been engaged in the manufacture of wire muzzles, but will hereafter make all kinds of wire novelties. A. W. Swender, the vice-president, has been in St. Louis making the necessary arrangements.

The International Electric Fixture & Contracting Company, St. Louis, has been incorporated. The capital stock is \$10,000. The incorporators are Oliver T. Hiras, Paul Brown, Jr., and Robert Holmes.

The General Novelty Mfg. Company, St. Louis, has been incorporated, with a capital stock of \$15,000. The incorporators are Frank Bishop, Donald H. C. O'Neil and H. C. Barker. The company will manufacture auto parts.

The Donnell Sanitary Milk Can Company, St. Louis, has been incorporated, with a capital stock, fully paid, of \$50,000. The incorporators are W. F. Donnell of Hematite, Mo.; John F. Meier of Pevely, Mo., and L. W. Meier of St. Louis.

The largest brewery machinery manufacturing plant in the world will soon be established in this city. This is assured by the incorporation of the Busch-Sulzer-Borschers-Diesel Engine Company at St. Louis, with a paid up capital stock of \$2,100,000. The company will erect a large factory at South St. Louis, on land already purchased. The officers

will be chosen at the first meeting of the new corporation, February 2.

The Acme Tool Company, Jennings, Mo., has been incorporated, with a capital stock of \$150,000. The incorporators are William Klasing, Louis Klasing and F. J. Steiner.

The Faeth Iron Company, Kansas City, Mo., has increased its capital stock from \$225,000 to \$350,000.

The Aurora Electric Light & Water Company, Marionville, Mo., has settled upon a site for its plant. Work on the plant and the laying of water mains will begin at once. The cost is estimated at \$25,000.

The Manchester Milling Company, Manchester, Mo., suffered the loss of its flouring mill by fire January 21. The loss is estimated at \$100,000.

A. F. Sievert was in St. Louis last week assisting Mr. Boettger of Warrenton, Mo., in the selection of machinery for his new ice plant.

Water Commissioner Atkins of St. Louis, Mo., has petitioned the Council for an appropriation of \$750,000 for improving the city water system. Of this amount \$100,000 will be used for the erection of a new boiler house at Bissell's Point and new equipment, including turbine engines; revetment of the river bank at Chain of Rocks, \$150,000, and a new distribution department to cost \$250,000.

### Cleveland

CLEVELAND, OHIO, January 31, 1911.

The outlook in general machinery lines is improving and many manufacturers report a satisfactory volume of orders. The machine tool market continues somewhat quiet. Local dealers are getting a little better volume of orders, but they are mostly for single tools. The buying is largely scattered and inquiries of any size are lacking. Practically no business is coming from the railroads. Business with crane builders has improved considerably, but orders are mostly for small equipment for small industrial plants. The demand for foundry supplies shows an improvement. In the foundry trade orders for aluminum and malleable castings have improved, some business now being placed by the automobile trade, and makers of gray iron castings are looking for an increase in orders from this source shortly. With the improvement in general conditions more new concerns are being formed in metal working lines than for some time past and some inquiries are developing from this source for small lots of machine tools. As good deliveries can be secured, the placing of these orders in many cases are being deferred until the equipment is needed.

The Stuyvesant Motor Car Company has taken over the plant formerly owned by the Gaeth Automobile Company on West Twenty-fifth street, Cleveland. The new company will manufacture both touring cars and commercial trucks. The plant will be enlarged by the erection of a building on an adjoining site. Additional floor space to the amount of 30,000 sq. ft. will be provided. Plans have been prepared and the work will be started very shortly. Considerable new machinery will be purchased, according to present plans. Frank E. Stuyvesant is president of the company.

The Mora Power Wagon Company, Cleveland, has been incorporated, with a capital stock of \$750,000, to manufacture commercial power driven vehicles. S. H. Mora and others are interested in the company.

The Foundries Company, Orrville, Ohio, has been incorporated, with a capital stock of \$10,000, by H. D. Shannon, D. Ed. Seas, George Wendling, H. A. Smitzer, Benj. Wheeler, R. A. Kinney and B. G. Cope.

The National Metal Specialty Company, London, Ohio, has been incorporated, with a capital stock of \$50,000, by Clyde C. Thomas, M. B. Armstrong, Harry C. Haines, R. W. Boyd and Eb. Converse.

The Toledo Pipe Threading Machine Company, Toledo, Ohio, has recently completed additions to its plant, largely increasing its capacity. A new building has been erected, 40 x 200 ft. and two stories. A new power plant and a new pattern shop have also been provided. The new power equipment includes two boilers and a 150-hp. engine. The company will hereafter make its own screw parts, having installed automatic machines for that purpose. All the machinery is now motor driven under the group system. The company reports an increase of 30 per cent. in its business during 1910, as compared with the previous year, and a still larger gain in orders during the present month as compared with January, 1910.

The Toledo Bridge & Crane Company, Toledo, Ohio, is extending its business to the ore handling field and will make bridges and other handling equipment. The company reports a very satisfactory volume of business during the past year, the sales of its crane department having reached \$200,000. This company has just completed the installation of a Gantry



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crane and bucket for handling coal at the power plant of the Toledo Railways & Light Company.

The Toledo Machine & Tool Company, Toledo, Ohio, has under construction two huge presses, each of which is the largest of its type ever made. One is a triple crank 14-ft. press and the other a single crank 5-ft. press. Each weighs 275,000 lbs. This company reports that its business during 1910 was double that of the previous year and that the outlook for the present year is quite encouraging.

The National Supply Company, Toledo, Ohio, is planning large extensions to its plant during the present year. Three buildings will probably be erected in which to manufacture oil well supplies. The company will install new forge shop machinery and probably other equipment.

The Aluminum Products Company, Canton, Ohio, has been incorporated, with a capital stock of \$250,000, to manufacture aluminum sheets and various aluminum products. Outside capital is largely represented in the project.

The Favorite Stove & Range Company, Piqua, Ohio, will enlarge its plant by the erection of an additional building for the molding department. The building will be 110 x 300 ft. Other departments will also be enlarged.

The Defiance Chamber of Commerce, Defiance, Ohio, has been organized to promote the business interests of the city, and especially to bring new industries there. The officers are T. T. Ansberry, president; S. A. Craven, vice-president; I. M. Adams, secretary, and Albert Diehl, treasurer.

The new foundry of the Davis-Price Company, New Cumberland, Ohio, has been placed in operation. The machine shop will be completed within a few weeks.

The Matthews Boat Company, Port Clinton, Ohio, will enlarge its plant by the erection of a concrete and steel building.

The Upper Sandusky Electric Light & Power Company, Upper Sandusky, Ohio, has been purchased by the American Gas & Electric Company, Providence, R. I. It is understood that the plant will be overhauled and new equipment installed.

### Indianapolis

INDIANAPOLIS, IND., January 31, 1911.

The Enterprise Foundry & Fence Company, Indianapolis, has increased its capital stock from \$50,000 to \$75,000.

The Bedford Stone Product Company has been incorporated at Bloomington, Ind., with \$50,000 capital stock, to quarry stone. The directors are James Wampler, C. L. Beck and George W. Bollenbachner.

The Ford Meter Box Company has been organized at Wabash, Ind., with \$25,000 capital stock, to manufacture water meters. The directors are E. H. Ford, T. W. and W. A. McNamee.

The Isbell-Strickland Company, Elkhart, Ind., has been incorporated with \$10,000 capital stock, to manufacture building materials. The directors are E. E. Isbell, C. B. Isbell and H. J. Isbell.

The Brook Novelty Company, Brook, Ind., has been incorporated, with \$30,000 capital stock, to manufacture novelty goods. The directors are L. E. Lyons, L. C. Lyons, Edward Hess, J. B. Lyons, Sr., and W. A. Bringham.

The Fortune Post Company, Richmond, Ind., has been incorporated, with \$10,000 capital stock, to manufacture fence posts. The directors are Mather B. Kelsey, J. E. Peltz and H. B. Williams.

The Siler-Petit Mfg. Company, Fort Wayne, Ind., has been incorporated, with \$250,000 capital stock, to manufacture pumps, liquid storage and distributing systems. The directors are E. E. Siler, B. F. Petit, G. S. Hanford, M. J. Martene and E. M. Hulse.

The Bahr Brothers Mfg. Company has been incorporated at Marion, Ind., with \$25,000 capital stock, to manufacture machinery. The directors are Amel F., Otto B. and William F. Bahr.

The Electro-Lighting Company, Indianapolis, recently incorporated, with \$100,000 capital stock, will manufacture a device for furnishing electric searchlights for automobiles, by means of dynamos, connected direct to the engine and running at engine speed. A storage battery for use when the engine is not running, and which is automatically charged, will be used with the new device. The device provides ignition as well as lighting, and, in location, as well as use, takes the place of the present magneto. It is said to overcome the difficulties of governing the dynamo current under the variable speed of the engine, also to overcome the overcharging of the battery, the current being automatically cut off when the battery is fully charged. Until a permanent location for a factory is found the dynamos and coils

will be made under contract. The officers of the company are: President, S. C. Renick; vice-president, Charles C. Wedding; secretary-treasurer, Joseph E. Bell; assistant secretary, W. H. Harbison. The officers are in the Board of Trade Building.

The Vincennes Electric Company has been incorporated at Vincennes, Ind., with \$20,000 capital stock, to furnish heat, light and power. The directors are W. T. Barnes, A. J. Heitz and C. W. Sherman.

The Miller Shoe Mfg. Company, Cincinnati, will build a branch factory at Greensburg, Ind., to manufacture uppers exclusively. The company may equip a building already there. The company's capital stock will be increased in order to provide for the extension.

Frank E. Towns, Gary, Ind., proprietor of the Hoosier Machine Shop, is erecting a machine shop, 30 x 60 ft., which he expects to have ready for occupancy about February 15. The shop will be equipped for general repair work, including two lathes, drill press, gas forge, bracing forge, shears and punch, bicycle repair outfit and overhauling tools for automobile work, universal milling machine, shaper and large drill press, one rail traveling hoist and oxy-acetylene welding plant.

The Goshen Churn & Ladder Company, Goshen, Ind., is contemplating the erection in the spring of a two-story brick factory and office building, 64 x 156 ft., and a power plant and dry kiln. Details of equipment to be installed have not been decided upon.

The American Motors Company, Indianapolis, Ind., has purchased the assets of the American Motor Car Company of that city, taking over all of its contracts and assuming all of its liabilities. The capital stock of the company will be materially increased and its manufacturing facilities extended. The officers of the company are as follows: V. A. Longaker, chairman of Executive Board and general manager; J. I. Handley, president; D. S. Menasco, vice-president; J. D. Bright, treasurer; J. E. Kepperly, secretary.

The Dille & McGuire Mfg. Company, Richmond, Ind., is contemplating extensive improvements to its plant during the spring, plans for which are now being prepared. The new buildings will be erected on ground adjoining the present plant and when completed will cover a city block. The buildings will be of fireproof construction and electricity will be used for operating power.

### Detroit

DETROIT, MICH., January 31, 1911.

The interest among the manufacturers of this city this week is mainly centered upon the proposed reciprocity agreement with Canada. Directly across the river from this city is the city of Windsor, Ontario, a manufacturing center of importance, which possesses several branch factories of Detroit concerns, particularly automobile. Naturally the latter and also the manufacturers of farm implements, both products of which are included in the proposed agreement, are somewhat interested, but in neither case are they of the opinion that there will be any immediate change in prices. Thus far January gives promise for a great year, especially in the automobile industry. More stability seems prevalent than at any time last year.

The American Auto Trimming Company of this city will occupy as its main factory the manufacturing plant recently vacated by the Hudson Motor Car Company. It is a two-story building of mill construction, occupying a ground space of 54 x 400 ft.

The Snell Creamery Company, Detroit, incorporated a short time ago, has commenced construction on the buildings of the plant, located at Highland Park. The main building will be 40 x 120 ft., and the barn 50 x 200 ft.

The Diamond Match Company of this city has generously advised the Patent Office that its patent on the sesqui-sulphide match-making process is now open to use by independent match manufacturers, and the dangerous use of the white phosphorus, the cause of bone necrosis to workers, will no longer be necessary.

The administration building of the Lozier Works, in the course of being transferred from New York, is nearing completion, and the employees of the general offices are preparing to occupy their new quarters in this city.

Morris Grabowsky, vice-president of the Alden Sampson Mfg. Company, has confirmed the report that the \$350,000 plant of the Sampson organization will be transferred from its present location at Pittsfield, Mass., to this city. The factory in the former city will be closed on January 31, and

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the machinery immediately moved by motor truck to two special trains, and thence shipped here.

The annual meeting of the Detroit Pressed Steel Company resulted in the election of the same directors and officers as last year. The capacity of the plant has been enlarged, and the line of products extended. The capital stock is increased from \$60,000 to \$200,000.

The Fenn Mfg. Company, Charlotte, Mich., filed articles of incorporation. This is a change from the co-partnership to facilitate business. The company possesses the patent on a machine devised to automatically bend scythe snaths.

The Marquette Motor Works, Saginaw, Mich., will move into its immense new machine shop about February 1. The force of men employed will be increased by about 150 when improvements are completed.

Articles of association of the American Stamping Company, Battle Creek, Mich., have been filed. The purpose of the corporation will be the manufacture of oil cups, grease cups and metal goods used principally by manufacturers of automobiles, engines, hardware and plumbing goods. The stock is held by E. L. Estes of Mendon, J. M. Benjamin of White Pigeon and L. H. Sabin of Battle Creek.

A reorganization of the office force of the General Motors Company at Pontiac, Mich., is in full swing. George A. Horner and W. A. Voss, general manager and assistant, respectively, of the Rapid Motor Vehicle Company, have both resigned. Other changes will follow.

The Alpena Portland Cement Company, Alpena, Mich., has asked for the appointment of a receiver. The plant has not been in operation since 1909.

### Baltimore

BALTIMORE, Md., January 31, 1911.

Business in the iron, steel and machinery trades in this territory has been somewhat irregular during the past month. Transactions in the first half of January were restricted, but an increased demand in the last half has brought the aggregate volume in some lines up to, and in a few instances in excess of, the average. In the machine tool trades business continues light, buying being of the small lot order, with few inquiries of any size under consideration. Railroad buying has also been very light. Contractors' supplies and equipment have been dull, as is usually the case at this season. In general machine shop supplies, dealers report a fair volume of business, resulting largely from the placing of orders held up prior to the first of the year. Builders of special tools note an increasing demand and in a number of instances plants engaged in that character of work are quite actively engaged. Considerable irregularity is still to be noted in the foundry trade. While January is usually a dull month in the building trades, quite a few contracts for buildings for manufacturing purposes have been placed and negotiations are under way for a fair amount of new work, both locally and in the Southern territory. Fabricators of iron and steel report a fair month's business and estimating departments are actively engaged on specifications for further work. Complaint is heard that, notwithstanding the fact that prices for finished materials have been maintained, those for fabricating and erecting work are being shaded and quotations are in some instances reported as being below actual cost. Municipal contracts have not been very heavy; while considerable work of this character is in prospect, little has been recently contracted for. The trade generally looks forward to a larger volume of business in the near future, and it is believed that the increased volume closed during the latter part of the month is but a forerunner of a gradual betterment which will ultimately extend to all branches of the trade. There has been a better demand for boilers and engines, and engineers are making further bids on a fair run of new business.

Announcement has been made that preliminary plans for a large power house to be erected at Boston and Patuxent streets, for the American Tobacco Company, are being prepared by Architect T. W. Pietsch. The structure is to be fireproof and the engineering features will be looked after by Painter & Posey, engineers.

The Atlantic Fertilizer Company is planning to make extensive improvements to its Curtis Bay plant the coming spring. A manufacturing building, 170 x 420 ft., of steel and concrete, and other additions are being considered.

Fabricators are estimating on the structural work, 250 tons, for additions to the buildings of the Home for the Feeble Minded, at Owings Mills, Md.

Bids were opened January 25 for the heating, ventilating and power plant for the addition to the Hochschild-Kohn Company department store, but awards have not yet been announced.

The Davidson Chemical Company has plans under consideration for an enlargement of its plant and bids have been taken for some of the building work. The improvements, it is stated, consist of three buildings of steel construction—one an acid chamber building, another a burner building and the third for general storage purposes.

The Maryland Casualty Company has had plans prepared for extensive additions to its present buildings. Adjoining property has been acquired for this purpose. Otto G. Simonson is the architect and Henry Adams engineer in connection with the work, which will not be started, however, for several months.

The W. & J. Knox Net & Wire Company is about ready to begin the work of erecting a two-story brick and concrete addition to its plant at Johnson and Barney streets. Machinery for the manufacture of nets and twine for installation in the new plant is stated to have been contracted for.

The Miller Fertilizer Company will make extensive additions to its Canton plant, which will be remodeled in many ways. A system of hoisting machinery, cranes, &c., will be installed. Architect T. Wells Pietsch is taking bids for alterations to the building, while Painter & Posey have charge of the engineering features in connection with the improvements.

Revised plans in course of preparation by architects and engineers for the extensive buildings to be erected for the Baltimore Bargain House will, it is now stated, be ready for estimate about the middle of the month. Recent proposals for the work under the original plans and specifications were rejected.

The McShane Bell Foundry Company has made considerable additions to its brass finishing department for plumbers' goods. About 4000 sq. ft. of floor space has been added, and equipment to increase the capacity of the department about one-third has been installed and will be added to as the business demands.

Dietrich Brothers have recently booked orders for the structural steel work, about 150 tons, for the Kriel Building, and about a like tonnage for a building for the Owners' Realty Company. A fair amount of miscellaneous business has also been taken. The new office building being erected for its own use by this firm is nearing completion, as is also its new ornamental iron shop. Work on its new structural shop is being rapidly pushed forward.

The Canton Box Company has awarded a contract to George A. Blake for a new factory building, 117 x 125 ft., two stories, of brick and concrete construction. The company, which manufactures wooden boxes, states that some machinery will be required for the new building, but the character or quantity has not yet been decided upon.

The John C. Raum & Son Company, carriage and wagon builder, has let a contract for the erection of an addition, 19 x 95 ft., to its plant at 303 South Sharp street. The new building will be used as a blacksmith shop and purchases of steam hammers have already been made, but the company is still in the market for a band saw, emery wheels and stands and drill presses.

John D. Adt has taken orders for elevator plants to be installed in the new plant of Dietrich Brothers, and in additions under way by the Monumental Brewing Company. Large orders for tobacco drying machinery have also been received from the Italian Government. Extensive orders for special machinery have also been taken. The plant is fully engaged, notwithstanding the fact that its working capacity has recently been increased over one-third.

Ernest and William Knabe, who sold their interest in the William J. Knabe Piano Company to the American Piano Company, contemplate again entering the business of piano making. Plans regarding the proposed plant or its location have not fully developed, and it is stated by Ernest Knabe that nothing definite will be done for several months.

The Baltimore Bridge Company reports a seasonable business during the past month. Current orders were not particularly large, but its estimating department is busy on a considerable amount of miscellaneous work. Recent orders include a 150-ft. span, known as the Destierro span, for the Northern Railway of Costa Rico, wireless telegraphy towers for shipment to Cuba, and one for 150 tons of sheet piling for export to Costa Rico. Domestic orders during January were mostly small and of a miscellaneous character.

The Chamber of Commerce, Washington, D. C., has been instrumental in providing a site at Hollywood, a suburb of that city, for a plant to be erected for the manufacture of a line of wagons by the National Wagon Company, with offices in the Fleming Building in that city. The latter company states that as soon as financial matters are completed, which will require several months, work on the new plant will be started. A. D. Phillips is secretary of the company.

The Maryland Steel Company launched successfully on January 21 the collier *Neptune*, building for the United States Government. This is the first collier for the govern-



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ment in which turbine engines will be used. The vessel will have a carrying capacity of 12,500 tons of coal. The company is also building, among others, two boats for the Chesapeake Steamship Company, which will be used in the Chesapeake Bay service.

The Chesapeake Iron Works has taken orders for the structural steel work for the addition to the plant of the Morris Iron Company, Frederick, Md., also the structural and ornamental iron work for a hotel building in Grafton, W. Va., and is estimating on a very fair amount of new work. Business the past month has been close to the average for the first month of the year, and but 10 per cent. below that for January, 1910. The outlook for future business is looked upon as more favorable by this concern.

The Crook-Kries Company, heating and ventilating engineer, has recently taken an order for the boiler equipment for the Southern Building, Washington, D. C. The installation will include two 125-hp. water tube boilers, the order for which has been placed. Inquiries are reported good, and the estimating department is busy on a number of plans, the major portion of which is for propositions of the smaller size. The company recently completed the installation of a central power plant for ex-Governor Edwin F. Warfield. The plant is located in a garage building, and, in addition to heating that building, also furnishes the heat for two residences, 1217 and 1219 Linden avenue.

The T. C. Bashor Company reports an exceptionally good demand for boilers and engines the past month, it being in fact one of the best first months of the year that it has ever had. Boilers will be installed by it for the Davidson Chemical Company and the Maryland Bleach & Dye Works. Boilers and engines will be supplied for the new plant of Becker Brothers & Sons, while an additional boiler is to be furnished the Weisner Brewery. Contracts for the heating and ventilating system for the addition to the Highlandtown plant of the Crown Cork & Seal Company have also been taken and the estimating department is busy figuring on additional work of that character. The company's plant is busy on a large amount of boiler, tank and special work.

The Morris Iron Company, to which reference was made in *The Iron Age* last week, proposes to treble the capacity of its plant at Frederick, Md. Contracts have already been let for additions to the buildings. Additional equipment will be required both in the foundry and machine shop, including overhead traveling cranes. Electric power will be extensively used and a plant for its own supply of current will probably be installed.

The Baltimore Gas Appliance & Mfg. Company, H. W. Hunter, president, which was recently organized, with an authorized capital of \$300,000, has leased a plant at Bayard and Wicomico streets, containing 2000 sq. ft. of floor space, for the manufacture of gas ranges, gas heaters, &c. The company will shortly ask for bids on machinery and other equipment for the manufacture of 30,000 gas ranges and 15,000 gas heaters a year. Martin W. Longfellow of the Estate Stove Company, Hamilton, Ohio, is to be general superintendent of the plant.

### Toronto

TORONTO, January 28, 1911.

While reciprocity negotiations were in progress at Washington, Canadian machinery manufacturers as a class were on the anxious seat. Makers of mining machinery, for example, had no more or less reason to expect to have their tariff protection left unimpaired than had makers of factory plant. That there would probably be reductions of the duty on agricultural machinery imported from the United States was the opinion of most people, but it would have caused no surprise had the machinery duties generally been lowered slightly in favor of that country. To the majority of Canadian machinery manufacturers, therefore, Mr. Fielding's presentation of the agreement in the House of Commons on Thursday afternoon brought genuine relief. It showed that reductions are conceded, but that they are not large, and that the list of them is not long. But these considerations do not make the arrangement acceptable to Canadian manufacturers. They are hopeful that Congress will fail to put the seal of legislation on the concessions made on the United States side and thus bring the agreement to naught.

The general offices of the Dominion Steel Corporation, at Sydney, N. S., were burnt on Wednesday evening. Among the things destroyed was a complete record of the company's affairs for the decade that has just closed. The building was valued at about \$50,000.

The Campbell Lumber Company's pulp mills at Weymouth, N. S., was built on Monday night, January 23, entailing a loss of \$50,000. The company had recently installed \$15,000 worth of new machinery.

The Canadian Locomotive Company, Kingston, Ont., has just completed one of the four largest engines ever made in its works. It is to be used on the Provincial Government's Temiskaming & Northern Ontario Railway line. The weight of engine and tender exceeds 118 tons.

The International Harvester Company of Canada has let a contract for a new office at its plant in Hamilton, Ont. It is to cost \$40,000. This is the last one in the series of buildings begun by the company last year, the total cost of which is put at nearly \$500,000.

The demand for gasoline engines suitable for fishing boats is reported to be large on both coasts of Canada, as well as on the lakes.

The rate payers of Calgary, Alberta, have voted in favor of certain modifications of the agreement under which the Calgary Natural Gas Company holds its franchise. It is stated that as a consequence of the larger license thus given to it the company will enter into an arrangement to pipe the gas to Calgary from wells at Bow Island, 150 miles distant. On this work \$3,500,000 would be spent.

Improvements that would cost \$140,656 have been recommended by the city electrician of Saskatoon, Saskatchewan, in the city's power plant and pumping plant.

Diamond drills are in demand for testing operations in the Porcupine gold field, in the Sudbury nickel region and in the Rainy River iron ranges. There are large plans for building in Porcupine.

Of the tenders submitted for the construction of a bridge across the St. Charles River at Quebec, L. A. Vorlee, the engineer consulted, selected five, which he narrowed down to two, and reported upon the latter as the most advantageous. One was the tender of J. H. Gignac, Ltd., for \$169,000, and the other was the tender of the Phoenix Bridge Company of Montreal for \$169,500. The latter, he said, conforms most closely to the Government plans. Both tenders are for a swing bridge. It was decided by the Road Committee of the Quebec City Council to defer action on the matter until tenders should be received for a bridge of the bascule type. Tenders for this will at once be called for.

The secretary of the Board of Trade at Calgary, Alberta, is receiving numerous inquiries as to the advantages obtainable in that city for new manufacturing enterprises there. On Tuesday he was applied to by a large company in Illinois for particulars as to the terms on which natural gas could be supplied there. The company stated that it desires to establish a plant that would require labor enough to earn \$125,000 in wages the first year.

The City Commissioners of Calgary, Alberta, advise the expenditure of \$75,000 on fire station and equipment account.

The Ontario Government is offering two large pulp wood concessions for long term lease, with right to renew cutting rights at the end of the period. One is the Abitibi section of the Temiskaming district and covers 1569 sq. miles. The successful tenderer for the privilege must expend \$500,000 on buildings and equipment for mill purposes and employ steadily 250 men. The other is a Rainy River section. There the mill is to cost \$350,000 and 200 hands are to be employed.

The Joliette Steel & Iron Foundry Company, incorporated with a capital stock of \$250,000, has opened offices at 371 St. James street, Montreal. The company will manufacture various classes of iron and steel castings.

The Exshaw Cement Company's plant at Calgary was sold at auction on January 18 to the Canada Cement Company, the price being \$1,000,866.

Vice-President Whyte of the Canadian Pacific Railway Company says that the company's shops at Winnipeg will be made one-third larger.

Another \$300,000 is required for the completion of the municipal power station in Calgary, Alberta. A by-law is being prepared for submission to the ratepayers to authorize the raising of that sum on this account. Much of the money is required for the purchase of equipment.

The Board of Control of Ottawa has decided that another fire engine must be purchased, the fire chief recommending one of 750 gal. per minute.

A 600-ft. dry dock, capable of accommodating the largest Canadian vessels on the Great Lakes, is projected for Amherstburg, Ont. There is to be a large machine shop as well, and it is expected that a shipbuilding plant will be added. A. H. Clark, M.P. for Essex, is one of the principal parties connected with the undertaking.

The factories of the Massey-Harris Company in Toronto are now working day and night and 2000 men are employed.

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### The South

CHATTANOOGA, TENN., January 30, 1911.

Johnson City, Tenn., is considering the plans for the new \$500,000 water system which is to furnish water for the city and the Soldier's Home. The distance from the city to the Big Blue Springs, from which the water is to be obtained, is 12 miles.

J. H. Hice, of the Ivey & Hice Company, Hickory, N. C., has sold his interest in the corporation and will establish at Johnson City, Tenn., a similar plant for the manufacture of textile novelties. The new company will have a capital stock of \$25,000.

The Mandeville Creamery & Mfg. Company of Mandeville, La., has let the contract for the creation of its plant. The machinery has already been ordered.

The Feriday Hoop Company, Feriday, La., will soon be ready to start up. The plant was removed from Spencer, Ohio. J. E. Ormsby is the general manager. Fifty men will be employed in the manufacture of hoops.

The J. L. Pease Company, Berwick, La., has recently ordered three carloads of improved appliances which will be installed in its plant. The company is engaged in the manufacture of patented built-up porch columns. After the new machinery is installed, the working force will be increased to 300 men.

The Many Ice, Water & Light Company, Many, La., has been organized. The president is Prof. W. C. Roaten; vice-president, J. H. Boone; secretary, R. Frazer; treasurer, W. H. Vandegear; and W. Robinson, general manager. The building will cost \$12,000.

The Madisonville Chair Company, Madisonville, Tenn., has taken over the business of Kile Brothers of that city and has purchased property with a view to extending the capacity of the latter company's chair manufacturing plant. The company will arrange to manufacture 1000 chairs a day.

The United States Engineer's office, Nashville, Tenn., is asking for bids to be opened February 20 for furnishing machinery, fittings, &c., for the derrick boat Tishomingo.

E. P. Epps, city engineer, Gainesville, Ga., is preparing plans for a water works and sewer system for that place to cost approximately \$100,000.

The H. S. Jaudon Engineering Company, Savannah, Ga., is preparing plans for a water works system of 2,000,000-gal. capacity, to cost about \$30,000, for the city of Dalton, Ga. Bids will be opened about March 1.

The Thomas Grate Bar Company, Birmingham, Ala., has acquired the plant of T. F. Johnson, Forty-second street and Tenth avenue, East Birmingham, and will equip it for the manufacture of the Thomas elliptical grate bar. Edward L. Thomas is president and W. D. Webster secretary of the company.

The Carolina, Clinchfield & Ohio Railway is reported to have made application to the Charleston, S. C., Harbor Commission for a permit to erect coal piers on its property at Cooper River.

The Weeks Iron Works & Supply Company, Monroe, La., is in the market for a 1000-lb. steam hammer. Inquiries should be addressed to George G. Weeks, president of the company.

### The Southwest

KANSAS CITY, Mo., January 30, 1911.

The Imperial Heater Company, Kansas City, Mo., advises that it has not definitely decided whether it will remove its factory to Lawrence, Kan., but that it expects to reach a decision within the near future.

The Oklahoma Light Mfg. Company, Guthrie, Okla., has decided to remove its plant and offices to Oklahoma City. A site has been secured in the Delmar Heights addition from the Packington Development Company, upon which will be immediately begun the erection of a brick building, 25 x 100 ft., two stories. Other buildings will be erected as they are needed. The company manufactures acetylene and other gas lights and fixtures, and its capital stock is \$25,000.

The Acme Spring Bed & Mattress Company, Fort Smith, Ark., is contemplating improvements to its plant during the coming summer to take care of its increasing business.

The Pine Bluff Bottling Company, Pine Bluff, Ark., has been reorganized, to include a number of new stockholders, with a capital stock of \$25,000. Lawrence Dixon is the president.

H. W. Lowe has leased the canning factory at Florence, Neb., and will enlarge its output.

The Titusville Iron Company of Pennsylvania will locate its Western office at Tulsa, Okla., about February 1. Thomas

McKinney, a director of the company, will locate there and manage the business.

### Milwaukee and the Northwest

MILWAUKEE, WIS., January 30, 1911.

The Reliance Iron & Engine Company, Racine, Wis., has signed a contract with the Industrial Association of La Crosse, Wis., for the removal of its plant to the latter city. Articles of incorporation have been filed with \$200,000 capital stock, and the name of the company changed to the Sta-Rite Engine Company. A site for the plant has not been definitely decided upon, but temporary quarters will be secured at once. The company will manufacture gasoline engines.

The La Crosse Plow Company, La Crosse, Wis., is contemplating the erection of a new foundry, for which plans have not yet been prepared.

The Columbia County Light & Power Company, Wycena, Wis., has purchased the water power and electric plant formerly owned by the Duck Creek Light & Power Company, and will install new machinery and construct a transmission line to Rio, Wis.

Colfax, Wis., is having plans prepared by Oscar Clausen, St. Paul, Minn., for the construction of a water works system.

The interest of dealers and sales agencies in the Twin Cities has been given principally of late to the announcement of the plans for a new steam turbine power station in Minneapolis, as mentioned below; but the most important news of the week from the standpoint of future business is contained in the report that the Westinghouse Electric & Mfg. Company, Pittsburgh, Pa., has made a contract with the Dakota Power Company, Rapid City, S. D., to supply electric current, from its new hydraulic power plant at Pactola, for operating the machinery at the four mica mines, operated by the former near Custer, S. D., in one of which additional equipment is now being installed. The significance of this deal lies in the fact that it means the running of transmission lines into an important mining region, with the substitution of electric motors for other forms of machinery drive, which inevitably occurs when the power is made available to mines or ore reduction plants. The Dakota Power Company has arranged to take over the generating station of the Rapid City Electric & Gas Light Company, combining it with its hydroelectric plant, so as to make one system of 5500 to 6000 kw., and will make further provision for supplying power to the mining districts as fast as the new system can be introduced. The Rapid City plant is to be remodeled and improved.

The Minneapolis General Electric Company, through its managers and engineers, Stone & Webster, Boston, Mass., is planning the construction of a new auxiliary plant for city service, at a cost between \$750,000 and \$1,000,000, to replace the combined engine and turbine driven station which was recently destroyed by an explosion. For the present dependence will be made for power upon the hydroelectric units at Taylor Falls, the number of which has just been increased. The company is also in possession of additional water power sites on the St. Croix and Mississippi rivers, which will be developed as the needs of the service increase.

It is reported from West Duluth, Minn., without direct confirmation, that a new plant will be built there this spring by the Osborn Pump Works, now located at Virginia, Minn.

The city of Fergus Falls, Minn., which has been purchasing power from the Otter Tail Power Company, is considering the erection of its own electric plant, to be equipped either with steam turbines or gas producer engine units.

The purchase of an auxiliary pumping unit is under consideration, with other improvements in the water supply system, at Eveleth, Minn.

The construction of a mechanical filtration plant has been decided upon by the authorities at Fargo, N. D., and bids on equipment will be taken before long.

It is reported from Mandan, N. D., that work on a wood-working plant, to be operated principally as a sash and door factory, will be begun there shortly by Rober Bros.

Measures for the installation of an electric power plant, to be operated either by the community or under a franchise, are being taken at Minto, N. D.

As negotiations for the purchase of the local water works recently failed, the city of Helena, Mont., has voted bonds for \$650,000 to cover the cost of constructing a municipal pumping plant and distribution system. Machinery will be bought some time this year.

The Northern Minnesota Railway Company has been organized at Virginia, Minn., by interests reported to be identified with the Virginia & Rainy Lakes Company, including Edward Hines of Chicago, Ill., to build an electric traction line.



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### Farther Central West

OMAHA, NEB., January 30, 1911.

The construction of a municipal power and pumping station, for which a fund of \$30,000 will shortly be available, has been decided upon at Adair, Iowa. Purchases of machinery will be made before spring.

An addition to its power plant will be constructed by the Griswold Milling & Light Company, Griswold, Iowa, and machinery for ice making installed to be operated as a day load.

Important extensions, including additional power machinery, are to be made in the system of the Charles City & Western Railway, Charles City, Iowa, during the present year.

A contract has just been made with the city by the Shenandoah Ice, Heat & Power Company, Shenandoah, Iowa, by which it guarantees to take over the municipal plant and install high pressure pumping machinery with a daily capacity of 250,000 gal.

Planing mill machinery will be installed in an addition which the Martin-Culberson Company, Des Moines, is planning to make to its plant.

Construction of the new line of the Iowa City, Ottumwa & Southwest Electric Railway, Ottumwa, which will be one of the longest in the State, is to be started in the spring.

The Sundance Oil Company, Sundance, Wyo., will install power and drilling machinery for opening up its property in that vicinity.

The plant of the Clinton Milling Company, Clinton, Iowa, owned by C. J. Claussen, was destroyed by fire January 23. The loss is estimated at \$20,000.

The proprietors of the Cedar Falls, Union Mill Company, Cedar Falls, Iowa, which was recently burned, causing a loss of \$50,000, announces that the flouring mill will be rebuilt. H. I. Brown is the manager.

Webster City, Iowa, has purchased a new site and a municipal light and power plant will be installed at a cost of \$50,000.

Fred Dutton and Thomas Thompson, Brighton, Iowa, will erect a plant for the manufacture of condensed milk, to cost upward of \$200,000.

The town of Rippey, Iowa, is advertising for proposals for the construction of a water works plant, until February 8.

The City Council of Marshalltown, Iowa, has authorized the Mayor to advertise for bids for machinery necessary to install a water power plant at the city pumping station, with a view to utilizing the power of Iowa River as far as possible.

T. F. Stroud & Co., Omaha, Neb., grading machinery, are erecting an addition to their plant and are in the market for an oil or gas engine of 75 hp., direct connected.

The Quick Action Range Company, Marshalltown, Iowa, has been incorporated with an authorized capital stock of \$225,000. The company will commence in the early spring the erection of factory buildings and foundries to manufacture the Quick Action range with its special patented adjustable grate.

The Vincent Clay Products Company, Fort Dodge, Iowa, a co-partnership, has been organized to manufacture drain tile and building blocks. A site has been secured and buildings will be erected as soon as possible. None of the equipment has been purchased.

W. J. Woods, Spencer, Neb., proposes to install an electric light plant, comprising two 35-hp. gas engines and two 3000-cp. dynamos.

Dodge City, Iowa, will install a municipal lighting plant to be operated in connection with its water works system.

The City Council of Utica, Neb., is considering the establishment of a water works system at a cost of \$15,000.

An appropriation of \$12,000 has been recommended for improvements to the water works system of Norfolk, Neb.

Auburn, Iowa, has estimates prepared for the construction of a \$10,000 water works system.

### Texas

AUSTIN, TEXAS, January 28, 1911.

The rapid development of sugar cane culture in the lower Rio Grande Valley of Texas is causing the establishment of a number of large sugar mills in that region. The demand for additional mills to care for the increased acreage of cane will be met by the erection of several plants during the next two or three years. In addition to the new mill to be built at Harlingen by Lon C. Hill and associates at a cost of \$400,000, plans for which have already been drawn; the new mill that is under construction at Donna by the Donna Land & Water Company, to cost \$250,000; the mill

which S. A. Robertson of San Benito and associates are preparing to erect at that place, to cost about \$400,000; the La Feria Sugar Company, which has its headquarters at Minneapolis, Minn., has had plans prepared for a \$500,000 sugar mill to be erected at La Feria, a new town in the lower Rio Grande Valley. J. C. Fifield of Minneapolis, president of the latter company, recently selected the site for the proposed mill, and has let the contract for its construction.

J. T. Lawler of New Orleans has taken preliminary steps toward erecting a flour mill of 250 bbls. daily capacity at Bryan, Texas. He contemplates installing an electric power and lighting plant in connection with the mill. He has made a proposition to the City Council of Bryan to sell the city his surplus power.

Joseph Sauter will install a broom factory at Devine, Texas. He is also enlarging his mattress factory at that place.

C. C. Murray & Sons have been granted a franchise by the Board of County Commissioners of Madison County, Texas, for an electric light and power plant at Madisonville. They will organize the Madisonville Light & Power Company to carry out the project. The company also contemplates installing an ice plant at Madisonville.

Another election has been ordered for February 14 by the City Council of Rusk, Texas, to vote on the proposition of issuing bonds for the construction of a water works system.

E. F. Glaze is constructing an ice factory and poultry packing plant at Goliad, Texas.

The water works system of El Paso is being extended and improved at a cost of \$300,000. The City Council recently purchased the site for the proposed garbage disposal plant which will be erected at a cost of \$100,000.

The Houston Brick & Tile Company which was recently organized will construct a modern brick and tile plant on the south side of the Houston ship channel in Houston. It will manufacture a concrete cement brick and tile, the latter to be used for drainage purposes. The plant will have a daily capacity of 55,000 brick and a large quantity of tile. The incorporators of the company are C. A. Barbour, C. R. Miner and Sinclair Taliaferro, all of Houston.

W. H. Randolph and Fred Smith of Huntsville, Texas, are installing a brick-making plant at that place. A concrete block manufacturing plant will be installed by the same parties.

J. Sandford Smith and associates are preparing to construct an interurban electric railway between Waco and Mexia, Texas. At a mass meeting of citizens which was recently held at Waco a committee was appointed to aid in the carrying out of the projected road. J. Desenberg of Mexia is also interested in the project.

The Texas Candelilla Wax Company, which was recently organized with a capital stock of \$25,000, will establish a factory at Marfa, Texas, for the manufacture of a high grade of wax from the candelilla shrub, a desert plant that grows profusely in that part of the state. This wax is being extensively manufactured from the plant in Mexico. It is marketed chiefly in Europe, where it is used for manufacturing phonograph records and other articles. The incorporators of the new company are F. S. Breeding, S. W. Wooley and W. P. Murphy.

The Victoria Safe & Lock Company will erect two buildings and install machinery for the manufacture of safes at Victoria, Texas. The plant will have a capacity of about 2000 safes a year. H. H. Stephenson is manager.

George M. Dickson, Henry M. Dickson, Charles M. Rein and R. G. Duff, all of Houston, are interested in the erection at that place of a plant to cost \$200,000 for the manufacture of metallic hose, which is an invention of W. M. Schulze of Houston.

Armour & Co., Chicago, will erect a three-story office building and refrigerating plant at Houston. An ice plant will also be installed. The proposed improvements will cost about \$125,000.

The Houston Structural Steel Company will increase the capacity of its plant at Houston to 100,000 tons per month. The company will also make improvements to its electric lighting system.

A granite crushing plant is to be installed at the granite quarries near Llano, Texas, by C. C. Baker and associates.

The Board of Water Commissioners of Temple, Texas, has adopted plans for a new filtration system to cost \$30,000. It will have a daily capacity of about 2,000,000 gal.

The contract for the construction of the new system of water works at Douglas, Ariz., has been let to M. C. Dicus of that place for \$85,000. The Chicago Bridge & Iron Works of Chicago, Ill., was given the contract to erect the water tower at a cost of \$11,950. The pumping equipment

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will be installed by the Denver Rock Drill & Mfg. Company of Denver, Colo., at a cost of \$9000, and the De La Vergne Machinery Company will install other machinery at a cost of \$20,000.

M. D. Loomis is preparing to install four irrigation pumping plants on his farm near Roswell, N. M. The water will be pumped from wells, each lift being about 35 ft.

Carter Smith contemplates enlarging his broom factory at Tucumcari, N. M.

The Guanajuato Power & Electric Company is installing a third hydroelectric plant on the Angulo River, in the State of Michoacan, Mexico. This plant will give the company a total capacity of 20,000 hp. It recently finished the construction of an electric power transmission line from its hydroelectric plants to San Luis Potosi, 87 miles.

The legislature of the State of Coahuila, Mexico, has granted Herculano Cerda and Vicente Garcia Fuentes an extension of 10 years to finish the construction of their cotton-seed oil mill and electric light and power plant at Torreon, Mexico, which are to cost about \$1,000,000.

The Zinc Smelter Company, Saltillo, Mexico, will soon begin the erection of a large zinc smelter at that place.

W. H. Ellis of New York and associates have been granted a concession by the Mexican Government for the construction of a number of factories in different parts of that country for the manufacture of crude rubber from the palo amarillo tree.

A syndicate of Chicago men is negotiating for the purchase of the water works system and electric light plant of the Tucumcari Water & Light Company at Tucumcari, N. M. If the deal is consummated the purchasers will make extensive improvements, it is stated.

The town of Sanderson, Texas, is considering the matter of purchasing the local water works system with the view of making improvements and extensions.

The National Railways of Mexico has begun preliminary work toward the erection of new shop buildings and the installation of a large amount of machinery at San Luis Potosi, Mexico. The terminals at that place will also be enlarged and otherwise improved, and a new union passenger and freight station constructed for the use of the several lines comprising the government merger system. C. M. Tripp of Atlanta, Ga., is in charge of the work.

The Texas Welding & Gas Compressing Company, Houston, Tex., recently incorporated with \$5000 capital stock, is planning to immediately double its capacity and to erect a factory at an expenditure of about \$25,000. The company uses its own welding process, designed by M. A. Mueller, secretary and general manager of the company. The process has been in operation in Germany for about 10 years, having been introduced in this country by Mr. Mueller.

Charles J. Stanzel, Brownwood, Texas, is constructing at Aransas Pass, Texas, a foundry, machine shop and boiler shop, each of which will occupy separate buildings. The foundry will be of five tons capacity and will do general foundry work and brass casting.

The Yost Brick, Tile & Stone Company, Cynthiana, Texas, has been incorporated, with a capital stock of \$25,000. The incorporators are C. T. Yost, S. T. Rowles and C. B. Hall.

### Pacific Coast

SEATTLE, WASH., January 27, 1911.

In plants all through the North Pacific States machinery that was ordered last fall is now being installed. For a considerable percentage of these it has since been found that additions will be necessary, owing to the fact that the requirements were too conservatively estimated, and there will be irregular buying for some time by companies whose needs have been reported filed. Inquiries in relation to machinery for new enterprises or improvements decided upon at the annual meetings held this month are also coming out in gratifying volume. Shipments for Alaska will be rushed forward as early as possible next spring, as there is imperative need of equipment for extensive operations which were decided upon too late to get the machinery out before the close of navigation. Buying will, therefore, be correspondingly early.

To meet the growing demand for their products from the industries on both sides of the border, the Stetson-Ross Machine Works, Seattle, will extend the shops now operated here and probably erect a branch plant at Vancouver, B. C.

Word has just reached Seattle of the remarkable record

made near Dawson, Y. T., by a dredge of the Marion Steam Shovel Company's build, which was in continuous operation for a season of 233 days, until stopped by heavy ice. This is the largest machine of the kind in the world and includes in its equipment electric motors of 1000 hp.

From Vancouver, Wash., it is reported that the Cascades Light & Power Company has been incorporated by W. W. Arnold, W. P. Connaway and others to build a hydroelectric plant on the north fork of the Lewis River.

The Seattle Electric Company, Seattle, is making preparations for building its new power plant.

The Cottage Grove Electric Company, Cottage Grove, Ore., whose plant is equipped with a Westinghouse alternating current generator of 200 kw., driven from an engine supplied by the Russell Engine Works, Massillon, Ohio, will install an additional boiler and electric unit if granted a 20-year extension of its franchise.

The North Star Mining Company, Orient, Wash., is installing an air compressor and 50 hp. motor for its operation. Other improvements are also to be made.

The Acme Mfg. Company, Tacoma, Wash., is about to start construction on its new woodworking plant, to replace the one that burned. Some of the machinery formerly in service can be utilized.

M. M. Valerius, Sutherlin, Ore., is organizing a company for building a power plant and an electric traction line.

The Washington Water Power Company, Spokane, Wash., is planning the erection of a new power plant in Opportunity and the remodeling of its transmission system for that section.

A campaign to secure new industries has been started by the Douglas Commercial Club, Douglas, Wash.

The Bellevue Electric Company, Bellevue, Wash., recently incorporated, will construct an electric plant to serve the large dairying district lying between lakes Washington and Sammamish and the coal mining and timber district adjacent, together with 20 miles of railroad. Construction work will commence in the spring, at which time the company will be in the market for power machinery and track equipment.

The United States Cashier Company, Portland, Ore., is erecting a factory for the manufacture of automatic coin playing machines.

Louis P. Larson, Coville, Wash., has been granted a franchise to construct and operate a water works and electric light system at Metaline Falls, Wash.

The Yuba Construction Company, Marysville, Cal., has acquired the business and equipment of the Western Engineering & Construction Company of that place. This is one of the oldest firms engaged in gold dredge construction in America.

### Government Purchases

WASHINGTON, D. C., January 30, 1911.

The Paymaster General, Navy Department, Washington, will open bids February 21, under schedule 3276, for one plain gap grinder.

The Bureau of Supplies and Accounts, Navy Department, Washington, will open bids for supplies for the department on dates as follows: February 14, schedule 3296, one water tube boiler; February 21, schedule 3312, two ventilating sets and schedule 3313, four 20-hp. gasoline engines; February 28, schedule 3297, one chisel mortising machine and one boring machine.

R. V. Ladow, Superintendent of Prisons, Washington, will open bids February 14 for furnishing and delivering at the United States Penitentiary, Atlanta, Ga., electric light and power installation for the hospital building.

The Department of Justice, Washington, will open bids February 16 for furnishing and delivering at the United States penitentiary, Leavenworth, Kan., electric light and installation for hospital buildings.

Bids were opened January 14 for furnishing laundry machinery for the Columbus barracks, U. S. Army, Columbus, Ohio, as follows:

Item 1.—Steam collar and cuff ironer—Troy Laundry Machinery Company, Ltd., Chicago, Ill., \$568.70; Columbia Mfg. Company, Columbia, Pa., \$650; American Laundry Machinery Mfg. Company, Cincinnati, Ohio, \$650.

Item 2.—Collar and cuff starcher—Troy Laundry Machinery Company, Ltd., Chicago, Ill., \$228.60; items 1 and 2, alternate bid, \$762.30; Columbia Mfg. Company, Columbia, Pa., \$300; American Laundry Machinery Mfg. Company, Cincinnati, Ohio, \$172.50 and \$215.



## Judicial Decisions of Interest to Manufacturers

ABSTRACTED BY A. L. H. STREET.

**Patentability of Old Machine for New Use.**—Application of an old machine or combination to a new use is patentable only when the new use is so remote from that to which the old machine has been applied, or which it was evidently conceived, that its application to the new use would not readily occur to the trained mind of the ordinary skilled mechanic, seeking to devise means to accomplish the desired function.—United States Circuit Court of Appeals, Eighth Circuit, Warren Webster & Co. vs. C. A. Dunham Company, 181 Federal Reporter 836.

**Employers' Liability for Negligence Concurring with That of Fellow Employees.**—An employer is liable for injury to a workman caused by failing to provide and maintain a safe place for the latter's work, notwithstanding concurrent negligence of fellow employees contributes to the injury.—United States Circuit Court of Appeals, Sixth Circuit, Bryson vs. Gallo, 180 Federal Reporter 71.

**Persons for Whose Negligence Employer Is Liable.**—An employee in charge of a particular piece of work as a subforeman or pusher is engaged in "superintendence" within the meaning of the New York employers' liability act (laws 1902, chapter 600), which makes an employer liable for injuries to workmen caused by the negligence of a superintendent or a person exercising superintendence.—United States Circuit Court of Appeals, Second Circuit, Pennsylvania Steel Company vs. Lakkonen, 181 Federal Reporter 325.

**Relationship Between Foreman and Workman as Affecting Employer's Liability.**—A foreman sent with workmen to install steel arches in a building, he having control of the work and being the employer's sole representative at the installation, was not a fellow employee of the workmen in such sense as to relieve the employer from liability for injury to the workmen caused by the foreman negligently ordering them to work upon an unsafe scaffold.—Minnesota Supreme Court, Johnson vs. St. Paul Foundry Company, 128 Northwestern Reporter 293.

**Employer's Duty to Warn Inexperienced Workmen.**—A workman in charge of a cinder pot in an iron and steel manufacturing plant, who is ignorant that liquid slag flowing into the pot may explode on contact with water, even after so far cooling as to become hardened on the surface, does not assume the risk of injury through an explosion so caused. An employer in assigning an inexperienced employee to work must notify him of extraordinary dangers likely to arise in the work, which the workman cannot see nor understand without such information.—Indiana Appellate Court, Republic Iron & Steel Company vs. Lulu, 92 Northwestern Reporter 993.

**Assumption of Risks by Workmen.**—A workman assumes such risks in his employment as are known to him or would be known to him by the exercise of ordinary observation and forethought. The danger to be apprehended from the breaking off and flying about of bits of steel from the point of a small steel cold chisel held against an iron surface and struck hard with a seven-pound hammer is so obvious that an employee of mature years and of experience in the use of steel drills must be held to have appreciated the danger, even against his testimony that he did not.—Maine Supreme Judicial Court, L'Houx vs. Union Construction Company, 77 Atlantic Reporter 636.

**Employers' Duty to Workmen Respecting Places Controlled by Third Parties.**—An employer is not ordinarily responsible for injuries sustained by an employee caused solely by an unsafe place of work which is owned and controlled by third persons. Circumstances may, however, impose upon the employer the duty of inspecting the premises of another, or of refraining from giving a workman orders to use those premises, or of giving the workman warning of danger in connection with their use.—Minnesota Supreme Court, Lingren vs. Williams Brothers Boiler Mfg. Company, 127 Northwestern Reporter 626.

**Liability for Injury to Contractor's Workman as Affected by Negligence of a Third Party.**—A steel company that contracted to erect the superstructure of a bridge on concrete piers built by another, and that directed the placing of the superstructure on the piers before the time required for the piers to harden had expired, cannot avoid responsibility for injury to a workman caused by collapse of a pier, on the ground that the company relied on the engineer employed to supervise construction of the bridge to warn the workmen of the danger, and to see that the place in which they were required to work was reasonably safe, since that was a duty which the company owed to its employees, and which cannot be delegated to a third person in such way as to exempt the company's responsibility.—Maryland Court of Appeals, Pennsylvania Steel Company vs. Nace, 77 Atlantic Reporter 1121.

**Implied Warranty of Machinery Sold by Manufacturer.**—

A manufacturer and seller of machinery cannot escape responsibility for latent defects in machinery, of which he is presumed to know, by providing in the contract of sale that there are no warranties.—Louisiana Supreme Court, American Hoist & Derrick Company vs. Frey, 53 Southern Reporter 486.

**Rights of Buyer of Scrap Iron Respecting Deficient Material.**—The fact that, through urgent needs, the buyer of scrap-iron accepted a shipment containing 40 per cent. of foreign material and used it did not preclude him from claiming a deduction from the agreed price, where the agreement permitted only a small percentage of foreign material. Notice of such claim was seasonably given where it was mailed November 2, though the shipment was received October 31, in view of the fact that a letter that day complained of the quality of the shipment.—Wisconsin Supreme Court, Nicoll vs. Modern Steel Structural Company, 128 Northwestern Reporter 72.

**Personal Liability of President of Corporation on Guarantee.**—An iron works company, having received an order from a plumbing company for goods, requested that the president personally guarantee payment. To this request the president wrote, "I will see that you are protected in any dealings you may have with this corporation." Held that he became personally liable.—South Carolina Supreme Court, J. L. Mott Iron Works vs. Clark, 69 Southeastern Reporter 227.

**Implied Warranty of Heating Plant Available to Owner of Building.**—In selling a heating plant to a contractor for installation by him in a building, the manufacturer impliedly warrants that it is reasonably fit for the purpose, and if the owner is damaged by defects in the plant he can set the amount of the damage off against a mechanics' lien claim by the manufacturer.—Kentucky Court of Appeals, American Radiator Company vs. McKee, 130 Southwestern Reporter 977.

**What Constitutes Warranty.**—Any distinct assertion or affirmation of quality made by a seller to effect a sale is a warranty whether the word "warranty" is used or not.—South Carolina Supreme Court, Her vs. Jennings, 68 Southeastern Reporter 1041.

**Implied License to Manufacture Patented Articles.**—Persons who bought from a patentee parts used in making a patented article had an implied license to manufacture as many articles as were required to utilize such parts.—United States Circuit Court, Southern District, New York, Auto Spring Repairer Company vs. Grinberg, 175 Federal 799.

**Right to Assign Trademark.**—A trademark can be assigned only in connection with a transfer of the business and good-will with which it is associated.—United States Circuit Court, Southern District, New York, Spiegel vs. Zuckerman, 175 Federal Reporter 978.

**Infringement of Patents—Equivalent Mechanism.**—As a means of propelling a vehicle, a sprocket chain drive is the equivalent of a bolt drive, as affecting the question whether one patent infringes another. The Hovey patent, No. 876,058, for a railroad motor velocipede propellable by hand, foot or motor, is valid, but is not infringed by Jenkins patent, No. 914,845.—United States Circuit Court, Northern District of Illinois, Sheffield Car Company vs. Buda Foundry & Mfg. Company, 177 Federal Reporter 713.

**Presumption of Joint Invention Not Overcome.**—The presumption of joint invention arising from the granting of a patent to two persons is not overcome by the fact that one of them first perceived the crude form of the elements of the device and the possibility of their adaption and composition to accomplish a useful result.—United States Circuit Court of Appeals, Sixth Circuit, Vrooman vs. Penhollow, 179 Federal Reporter 296.

**Infringement Not Excused by Manufacturer's Inability to Supply Demand.**—One cannot excuse infringement of a patent on the ground that the manufacturing patentee is unable to supply the demand for the patented device with promptness, and that users are subject to delay on that account.—United States Circuit Court, Eastern District of Wisconsin, Commercial Acetylene Company vs. Autolux Company, 181 Federal Reporter 387.

**What Constitutes Unfair Competition.**—Loss of the exclusive right of manufacture when a patent expires does not deprive the patentee of his right to protection against unfair competition resulting from efforts on the part of another to lead the public to believe that they are buying the patentee's product.—New York Court of Appeals, Westcott Chuck Company vs. Oneida National Chuck Company, 92 Northeastern Reporter 639.

**Infringement of Trademark.**—To constitute infringement of a trademark, duplication or exact imitation is not essential, it being sufficient that the marks are so similar that confusion or deception is apt to result. Infringement may occur though the infringer does not know that another has acquired the right to the exclusive use of the mark. The owner of a registered trademark need not await actual injury through infringement before suing to stop it.—United States Circuit Court, District of New Jersey, Eagle White Lead Company vs. Pflugh, 160 Federal Reporter 579.

## Trade Publications

**Boiler Feed Pumps.**—Dean Brothers Steam Pump Works, Indianapolis, Ind. Catalogue No. 83. Refers to a line of special boiler feed or pressure pumps, which includes pumps with compound and noncompound steam ends, outside center packed high pressure pumps and single and duplex double acting piston types of pumps. All of these are illustrated and described and brief tables of dimensions are included.

**Steam Heating.**—Warren Webster & Co., Point and Elm streets, Camden, N. J. Deals with the Webster vacuum, modulation and modulation-vacuum systems of steam heating, and gives reasons why it is desirable to use the products of this company. A number of illustrations showing buildings in which these three types of heating systems have been installed are included.

**Calendar.**—Mussens, Ltd., Montreal, Canada, dealer in machinery and supplies for railroads, mines, contractors, mills, factories, machine shops, &c., has issued a large calendar measuring 21 x 33 in. Each leaf contains a calendar for one month on the lower portion and the space in the upper part is used to display some of the various tools which this firm handles.

**Electric Motors.**—The Electro-Dynamic Company, Bayonne, N. J. Three circulars. No. 36 illustrates and describes the Inter-pole motor, which was illustrated in *The Iron Age* February 2, 1905. The special features of these motors are discussed, the various sizes and styles are shown and a number of test curves are included. No. 37 covers the subject of motor drive and shows a number of installations of the Inter-pole motors for driving machine tools. No. 38, superseding No. 35, contains data on the ratings and dimensions of the type S motor for various speed ratios of both open and closed adjustable speed motors, and also those operating at a constant speed.

**Lubricators.**—The Swain Lubricator Company, 250 Lake street, Chicago, Ill. Pamphlet. Describes and illustrates the Swain lubricator, the special advantages of which are economy, cleanliness and convenience. These lubricators are made in the form of cups in two different styles for shafting and for loose pulleys. The lubricant employed is a candle made of oil and petroleum products ordinarily, although special candles of asbestos, graphite and mica can be supplied in various sizes and degrees of hardness.

**Hydraulic Engines.**—Niagara Hydraulic Engine Company, 140 Nassau street, New York City. Pamphlet. Size 6 x 9 in.; pages 44. Pertains to the Niagara hydraulic engine, which is a new development of the hydraulic ram made in several sizes, ranging from one for supplying dwellings with water to one capable of supplying water for irrigation, operating mine washers and filling railroad water tanks. The construction of the engine is described at length, and this description is supplemented by drawings showing the various parts. A number of installations are shown and space is given to directions for installing the engine.

**Twine and Cordage Machinery.**—The Hoover & Gamble Company, Miamisburg, Ohio. Catalogue. Describes and illustrates a line of binder twine, rope and cordage machinery for manufacturing sisal and Manila twine and rope. The machines included are fiber breakers and spreaders, drawing frames, spinners, balling machines and tow cards.

**Sawmill and Threshing Machinery.**—Hellman Machine Works, Pine and First streets, Evansville, Ind. Catalogue No. 61. Describes with numerous illustrations a line of traction engines, threshing machines, portable and stationary engines, boilers, pumps, single and double sawmills, edgers, saws, lumber trimmers, hoisting engines, mine cages and ventilating fans.

**Wheels for Mine and Industrial Railroads.**—Lobdell Car Wheel Company, Wilmington, Del. Pamphlet. Shows the Lobdell tight and loose wheel equipment for mine and industrial railroads. In this equipment one wheel is fast on the axle, while the other is loose, and both revolve with it until curves are reached. At this point the loose wheel revolves sufficiently to relieve the strain occurring at that time. These wheels can be equipped with the Hyatt roller bearing or the ordinary brass bearing as desired.

**Elevators.**—Craig Ridgway & Son Company, Coatesville, Pa. Catalogue. Size 6 x 9 in.; pages 74. Covers a line of steam-hydraulic and electric elevators for freight and passenger service. In the former type the motive power is obtained by turning the steam into a closed cylinder partly filled with water, which at once has the same pressure as the steam and can be used for lifting, pushing, pulling and similar operations. All of the various styles of elevators are described at length, and the text is supplemented by illustrations.

**Boilers.**—Pennsylvania Boiler Works, Erie, Pa. Catalogue Q. Concerned with a line of portable and stationary horizontal and vertical return tubular boilers. The various types of boilers are illustrated and brief tables of specifications are included.

**Ditchers.**—The Browning Engineering Company, Cleveland, Ohio. Catalogue. Refers to the use of the Browning railroad

ditcher, which is a revolving steam shovel designed to be used in widening cuts, opening up ditches and light gravel pit work where the material is loaded on top of the flat car upon which the ditcher is carried. The construction of the ditcher is described at length and there are a number of illustrations showing it in actual use.

**Engines.**—Lake City Engineering Works, Erie, Pa. Catalogue. Consists of a number of loose leaf circulars referring to horizontal and vertical engines of the center crank type and pumping and dredging machinery. All of the different engines and pumps are illustrated and brief tables of specifications are included.

**Chucks.**—The Skinner Chuck Company, New Britain, Conn. Catalogue and price-list. Lists an extensive line of independent and universal combination lathe chucks, drill and planer chucks, face plate jaws, drill vises and reamer stands. The various types of chucks are all illustrated and briefly described, and a telegraph code for use in ordering completes the price-list.

**Governors.**—The Ludlow Valve Mfg. Company, Troy, N. Y. Four bulletins. No. 101 points out the factors to be considered in selecting a water wheel governor, which in the order of their importance are the type and then the size. No. 103 gives general description and specifications for the type M governor for turbines having cylinder or sleeve gates operated by a rotating shaft. No. 105 is devoted to the type K governor, which is the company's standard model for small turbine units with wicket gate control, while No. 106 calls attention to the type L, which is the standard for turbines having wicket gates operated by an oscillating shaft.

**Bench Lathe and Attachments.**—Moseley Lathe Company, Elgin, Ill. Loose leaf circulars. Pertain to a line of bench lathes and attachments for handling a variety of work. All of the attachments are illustrated and brief specifications are included.

**Motor Cars.**—Cadillac Motor Car Company, Detroit, Mich. Calls attention to the special features of the 1911 car and shows the various styles of bodies and tops that can be furnished.

**Gas and Gasoline Engines.**—Warren H. Jeffers, 373 Canal street, New York City. Pamphlet. Illustrates and describes the various sizes of Backus gas and gasoline engines and suction gas producers which he handles as a selling agent for the manufacturer.

**Seamless Tubing.**—Benedict & Burnham Mfg. Company, Waterbury, Conn. Brochure. Treats of the various weights and sizes of Benedict-nickel seamless drawn tubing for exposed plumbing, railings, &c., in residences, offices and public buildings. These tubes are made in two styles, one having white metal all the way through and the other having a steel lining which reinforces the white metal and is cheaper in price. A complete table giving the weight per foot of the various sizes of tubing is included.

**Cork Brick.**—Armstrong Cork Company, Pittsburgh, Pa. Pamphlet. Relates to the use of cork brick as a substitute for wood and concrete flooring. The special features of these bricks are described at length and directions for their installation are included.

**Lathes.**—Pringle & Brodie Machinery Company, 512 South Canal street, Chicago, Ill. Catalogue. Describes and illustrates a line of woodworking machinery which includes combination and variety wood turning lathes, an automatic back knife gauge lathe, a machine for turning wood rings and valve handles, a multiple spindle boring machine, a sanding or buffing machine for finishing dowel pins and single and double head dowel machines.

**Machinists' Tools.**—Athol Machine Company, Athol, Mass. Catalogue No. 31. Illustrates vises, grindstone frames, machinists' tools, &c.

**Sand Dryer.**—Hyde Brothers & Co., Commonwealth Building, Pittsburgh, Pa. Circular. Deals with the Steel City sand dryer, which is made in two sizes having capacities of approximately 10 and 5 tons per day, respectively. In use the wet sand is shoveled into the top of the dryer and as it dries runs out through holes in the bottom.

**Clay Working Machines.**—H. Brewer & Co., Tecumseh, Mich. Catalogue No. 50. Illustrations and descriptive matter explain the operation of a line of clay working machines that includes brick machines, drain tile and hollow block machines, automatic brick and tile cutters, clay granulators, pug mills, compound and straight roll crushers, dry pans, disintegrators, elevators and conveyors and hand operated cutters for brick, tile and hollow block.

**Air Compressors and Pneumatic Tools.**—Ingersoll-Rand Company, 11 Broadway, New York City. Three pamphlets. No. 3007 deals with the class PD air compressor, which is the latest power driven type. Its principal features are enclosed dust-proof construction with automatic flood lubrication for the main bearings, crank pins and cross heads and large valve area and intercooler surface. No. 5003 describes the Radialax air driven coal cutter, which is designed for undercutting in a pitching seam, shearing, mipping in the middle of the seam and cutting out bands in the coal. It is essentially a long stroke drill with



a special mounting to adapt it to the class of work it does. No. 9008 relates to a pneumatic tamping machine for relining copper converters.

**Calendar.**—The Goldschmidt Thermit Company, 90 West street, New York City, has issued a large calendar hanger. A large map of North America occupies the central portion of the hanger and there are three small illustrations of the principal work done by this company—namely, locomotive and marine repairs and rail welding. A list of the various kinds of repairs handled by this company and some of their products are also given.

**Presses.**—The Hydraulic Press Mfg. Company, Mount, Gil-ead, Ohio. Two catalogues. No. 31 pertains to a line of hydraulic presses and pumps for manufacturing emery wheels, pressing fiber board and making lard and veneer and leather belts. No. 30 describes and illustrates hydraulic presses and accumulators and pumps of various types.

**Twist Drills, Reamers, &c.**—The Cleveland Twist Drill Company, Cleveland, Ohio. Catalogue No. 37. Size 6 x 9 in., and pocket edition, size 4 x 6 in.; pages 214. Describes, illustrates and lists the complete line of the company's regular products, a number of tools not previously listed being shown. In addition to the main divisions of drills, reamers, &c., sections are devoted to tools for turret lathes, Paragon Flatwist high speed drills and sockets, Peerless high speed reamers and Paradox adjustable reamers. An innovation is the listing of high speed and carbon steel tools of the same style in parallel columns, which, it is believed, will prove a great convenience to prospective purchasers.

**Marine Engines.**—Fairbanks, Morse & Co., Chicago, Ill. Catalogue. Describes the full line of internal combustion engines for marine purposes built by this company.

**Spray Nozzles.**—Spray Nozzle Company, 201 Devonshire street, Boston, Mass. Bulletin No. 10. Briefly describes the radical improvements which have been made in spray nozzles and spray cooling systems during the past year. It is claimed that this system is more economical in first cost and operation than any other artificial means of cooling water for condensers, water jackets or other industrial purposes.

**Calendar.**—The Blake & Johnson Company, Waterbury, Conn., has issued a large calendar hanger measuring 31 in. square. The hanger is very attractive and the upper portion contains a large reproduction of the painting, "The Eternal Seas," while a small calendar pad occupies space at the bottom of the hanger.

**Milling Cutters.**—Barber-Colman Company, Rockford, Ill. Catalogue B. Size 4 1/4 x 7 1/4 in.; pages 87. Calls attention to an extensive line of carbon and high speed steel milling cutters, which include plain milling cutters with and without nicked teeth, side milling cutters, end mills of various types, metal slitting saws, angular cutters, gear hobs and various formed cutters. Brief specifications are given for all these cutters and a number of tables of useful information complete the catalogue.

**Road Making Machinery.**—Indiana Road Machine Company, Ft. Wayne, Ind. Four catalogues. Give general descriptions and specifications for a line of road making machinery which includes graders, a ditcher and wagon loader, dump wagons, wheel and drag scrapers, contractors' plows, stone crushers and road rollers and graders. All of these machines are illustrated and in addition space is given to engines of both the stationary and the traction types for use in connection with this line of machinery.

**Drop Forgings.**—Union Drop Forge Company, Chicago, Ill. Two folders. Call attention to the various kinds of drop forgings made by this company and show some of the different patterns. Among the lines illustrated are valve stems, weldless crank shafts of the single and double throw and the opposed center bearing types, connecting rods with and without T heads, yoke and rod ends, igniter levers and cams. In each case the various sizes in which these forgings are made are given.

**Railroad Supplies.**—Railway Appliances Company, Old Colony Building, Chicago, Ill. Catalogue No. 108 and two pamphlets. The first is devoted to the Globe ventilators for steam railroad cars and shows the construction of the ventilator and its use on railroad cars and in shops. One of the pamphlets deals with the Priest snow flanger, which is intended to be attached back of the pilot so that it will clear a space of about 1 ft. on each side of the rail, thus enabling the drivers to exert their full tractive power. The second pamphlet relates to the R A skid shoe, which is an emergency tool that enables train crews to clear the main track quickly of cars unable to be moved on their own wheels.

**Engines, Boilers and Feed Water Heaters.**—The Brownell Company, Dayton, Ohio. Catalogue No. 66. Lists an extensive line of engines, boilers and feed water heaters. The engines include an automatic self-oiling type, a self-oiling tandem compound engine, heavy duty automatic and slide crank and heavy duty slide valve engines. The boilers include horizontal tubular, portable locomotive, vertical tubular and Scotch boilers.

In addition to the feed water heaters, space is given to boiler settings, fronts, grates and smoke connections. All the various types of engines and boilers have complete dimension tables given.

**Threshing Machinery.**—Robinson & Co. Machine Works, Richmond, Ind. Catalogue. Size 7 1/2 x 10 in.; pages 40. Deals with an extensive line of threshing machinery, all of which is illustrated and described at length.

**Electric Motors.**—Roth Brothers & Co., Chicago, Ill. Bulletins No. 156, 161, 182, 193 and 199. Pertain to the line of electric motors manufactured by this company and show their adaptability for driving various kinds of tools.

**Air Compressors and Rock Drills.**—Ingersoll-Rand Company, 11 Broadway, New York City. Four bulletins. No. 3002 illustrates and describes the class A-1 straight line steam driven single stage air compressor and shows a number of installations. No. 4109 treats of Temple-Ingersoll electric air rock drills, which are pneumatic air drills driven by pulsations of compressed air created by a pulsator actuated by a standard electric motor. Nos. 9004, 9005 and 9006 relate to classes F, G and BF of the Calyx diamondless core drills.

**Friction Clutch.**—A. Plamondon Mfg. Company, 12 North Clinton street, Chicago, Ill. Circular. Relates to a disk type friction clutch possessing few parts and no springs, bolts or other complicated mechanism apt to become deranged in use.

**Valve Reseating Machine.**—The Leavitt Machine Company, Orange, Mass. Catalogue No. 15. Illustrations and descriptive matter explain the operation of the improved Dexter valve reseating machine for reseating all flat and taper seated valves of 1/4 to 12 in. diameter without disconnecting the valve. Space is also given to a disk cutter, and a partial list of users completes the catalogue.

**Clay Working Machinery.**—The C. W. Raymond Company, Dayton, Ohio. Two pamphlets. The first is a compendium illustrating the soft mud machinery and appurtenances made by this company for the manufacture of brick. The other deals with the Youngren producer gas fired continuous kiln and the Raymond periodical direct fired kilns. The operation and construction of these kilns is given and a number of views of installations are shown.

**Centrifugal Pumps.**—Buffalo Steam Pump Company, Buffalo, N. Y. Catalogue No. 230. Size 6 x 9 in.; pages 96. Deals with a line of horizontal and vertical belt, motor and engine driven single stage centrifugal pumps. The construction of these is described at some length and is followed by illustrations of the various styles. Space is given to float switches and motor starters and a number of tables of useful information complete the catalogue.

**Crucible Steel.**—Braeburn Steel Company, Braeburn, Pa. Catalogue. Pertains to the line of crucible steel manufactured by this company for various purposes. The various grades of steel are described and the labels attached thereto are reproduced. There are tables giving the weights of various sizes of bars, and a number of illustrations with dimensions of the various special shapes made are included.

**Calendar.**—The New State Iron & Supply Company, McAlester, Okla., wholesale dealer in hardware, mill and mine supplies, has issued a calendar measuring 15 x 20 in. The pad is of the customary type, and in addition to giving the days of the month also contains information regarding the moon's phases.

**Concentrating Table and Drills.**—The Denver Rock Drill & Machinery Company, Eighteenth and Blake streets, Denver, Colo. Three bulletins. T-1 describes and illustrates the company's concentrating table, while 3-S1 and 8-D2 show the Waugh hand sinker and the Waugh drifter, respectively. In all three bulletins the various parts of the machines are shown.

**Water Motor.**—The Chicago Water Motor & Fan Company, 40 Dearborn street, Chicago, Ill. Pamphlet. Describes the construction of the Chicago water motor and calls attention to its special features and shows a number of applications.

**Textile Machinery.**—Parks & Woolson Machine Company, Springfield, Vt. Pamphlet and circulars. Cover a complete line of machinery which includes polishing and brushing machines, shears, bolting machines, trade marking machines, folders and woolen and cotton napers.

**Portable Tools and Machinery.**—Stow Flexible Shaft Company, Philadelphia, Pa. Catalogue No. 30. Size 6 x 9 in.; pages 45. Refers to the use of the Stow flexible shaft for driving a number of portable tools from an electric motor or from a countershaft by the interposition of ropes. The various tools capable of being driven in this way are shown, as well as the manner of driving them.

**Folding and Cutting Machines.**—Dexter Folder Company, 200 Fifth avenue, New York City. Three pamphlets. These point out the advantages of using Dexter folding machines, the Dexter automatic clamp cutter and an automatic continuous feeding system for which this company is the sole selling agent. All the various machines are illustrated and described and brief specifications are included.

# CURRENT METAL PRICES.

The following quotations are for small lots, New York. Wholesale prices, at which large lots only can be bought, are given elsewhere in our weekly market report.

IRON AND STEEL— Bar Iron from store—			Genuine Iron Sheets— Galvanized.			METALS— Tin—		
<b>Refined Iron:</b>			Nos. 22 and 24 .....			Strait's Pig.....		
1 to 1 in. round and square.....			No. 26 .....			Copper—		
1 1/2 to 4 in. x 7/8 to 1 in.....			No. 28 .....			Lake Ingot.....		
1 1/2 to 4 in. x 7/8 to 1 in.....			<b>Corrugated Roofing—</b>			Electrolytic.....		
Rods—7/8 and 1 1/2 round and square.....			2 1/2 in. corrugated.....			Casting.....		
<b>Angles:</b>			No. 24.....			<b>Spelter—</b>		
3 in. x 1 in. and larger.....			No. 26.....			Western.....		
3 in. x 3 1/2 in. and 1/2 in.....			No. 28.....			<b>Zinc.</b>		
1 1/2 to 2 1/2 in. x 1 in.....			<b>Tin Plates—</b>			No. 9, base, casks.....		
1 1/2 to 2 1/2 in. x 3 1/2 in. and thicker.....			American Charcoal Plates (per box.)			<b>Lead.</b>		
1 to 1 1/4 in. x 3 1/2 in.....			"A. A. A." Charcoal:			American 1 1/2.....		
3/8 x 1/2 in.....			1 C, 14 x 20.....			<b>Solder.</b>		
3/8 x 1/2 in.....			1 X, 14 x 20.....			1/2 & 3/4, guaranteed.....		
3/8 x 1/2 in.....			A. Charcoal:			No. 1.....		
3/8 x 1/2 in.....			1 C, 14 x 20.....			Rellied.....		
3/8 x 1/2 in.....			1 X, 14 x 20.....			Prices of Solder indicated by private brand vary ac-		
3/8 x 1/2 in.....			<b>American Coke Plates—Bessemer—</b>			cording to composition.		
3/8 x 1/2 in.....			1 C, 14 x 20.....			<b>Antimony—</b>		
3/8 x 1/2 in.....			1 X, 14 x 20.....			Cookson.....		
<b>Teas:</b>			<b>American Terne Plates—</b>			Hamets.....		
1 1/2 in.....			1 C, 20 x 25 with an 8 lb. coating.....			Other brands.....		
1 1/2 in.....			1 X, 20 x 25 with an 8 lb. coating.....			<b>Bismuth—</b>		
1 1/2 to 2 1/2 x 1 1/2 in.....			<b>Seamless Brass Tubes—</b>			Per lb.....		
1 1/2 to 2 1/2 x 3 1/2 in.....			List November 11, 1908.....			<b>Aluminum—</b>		
3 in. and larger.....			<b>Brass Tubes, Iron Pipe Sizes—</b>			No. 1 Aluminum (guaranteed over 99% pure), in ingots		
<b>Beams:</b>			List November 13, 1908.....			for remelting.....		
Channels, 3 in. and larger.....			<b>Copper Tubes—</b>			Rods & Wire.....		
Hands—1 1/2 to 6 x 3 1/2 to No. 8.....			List August 1, 1908.....			Sheets.....		
Burden's Best Iron, base price.....			<b>Brazed Brass Tubes—</b>			<b>Old Metals.</b>		
Burden's "H. B. & S." Iron, base price.....			List August 1, 1908.....			Dealers Purchasing Prices Paid in New York		
Norway Bars.....			<b>High Brass Rods—</b>			Copper, Heavy cut and crucible.....		
<b>Merchant Steel from Store—</b>			List August 1, 1908.....			Copper, Heavy and Wire.....		
per lb.....			<b>Roll and Sheet Brass—</b>			Copper, Light and Bottoms.....		
Hessener Machinery.....			List August 1, 1908.....			Brass, Heavy.....		
Toe Calk, Tire and Sleigh Shoe.....			<b>Brass Wire—</b>			Brass, Light.....		
Best Cast Steel, base price in small lots.....			List August 1, 1908.....			Heavy Machine Composition.....		
<b>Sheets from Store—</b>			<b>Copper Wire—</b>			Clean Brass Turnings.....		
<b>Black</b>			Base Price.....			Composition Turnings.....		
One Pass, C. R.....			<b>Copper Sheets—</b>			Lead, Heavy.....		
Soft Steel.....			Sheet Copper Hot Rolled, 16 oz. (quantity lots).....			Lead, Tea.....		
No. 16.....			Sheet Copper Cold Rolled, 16 oz. advance over Hot			Zinc Scrap.....		
Nos. 18 to 20.....			Rolled.....					
Nos. 22 and 24.....			Sheet Copper Polished 20 in. wide and under, 16 sq					
No. 26.....			square foot.....					
No. 28.....			Sheet Copper Polished over 20 in. wide, 20 sq square					
			foot.....					
			Planished Copper, 16 sq square foot more than Polished.					
<b>Russia, Planished, &amp;c.</b>								
Genuine Russia, according to assort-								
ment.....								
Parent Planished, W. Dewees Wood.....								
per lb A, 10¢; B, 9¢ net.								
<b>Galvanized.</b>								
Nos. 12 and 14.....								
Nos. 22 to 24.....								
No. 26.....								
No. 28.....								
No. 20 and lighter 36 inches wide, 25¢ higher								

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